Domina Spencer – Class of 1939
(interviewed by Heather McDonald and Patricia Widener)

May 9, 2009
Heather McDonald and Patricia Widener spent the evening of Saturday May 9th, 2009 interviewing Domina Spencer (MIT Class of 1939) at the home of Terri Mascardo. The four had the following conversation over dinner and dessert. Domina’s Chihuahua, Nikki, was there too.

McDonald: I got it working so we're all set.
Mascardo: Alright, so go head and start.
McDonald: Okay, so you were saying that you did your undergraduate studies in?
Spencer: In Physics.
McDonald: Physics. And then did you do your Master’s and a Ph.D.?
Spencer: Yes, then I did my Master’s and my Ph.D. in Mathematics with a minor in Electrical Engineering.

McDonald: Interesting.
Spencer: So?
McDonald: We have many questions that we wanted to ask you. Did you do your undergraduate studies in 1938?

Widener: 1939.
Spencer: In ’39. I graduated from high school in ’37, in Philadelphia, from Friends Select School, which was founded by William Penn in 1689.
McDonald: Oh, wow. That's interesting. I was actually wondering, when were you born?
Spencer: Oh, I was born in 1920.
McDonald: 1920. Cool. We were just trying to figure that out.
Spencer: On September 26th.
McDonald: September 26th.
Spencer: So, I'm 88. And I feel as though I'm 16 (Laughter).
McDonald: I want to actually ask you a little bit about your experience before MIT. So you went to school in Philadelphia. Were you born in Philadelphia?
Spencer: No, I was born in New Castle, Pennsylvania.
McDonald: I'm from Western Pennsylvania. I actually grew up in Butler.
Spencer: From Butler? That's quite close to New Castle. Something like 30 miles or so?
McDonald: Yes, maybe like an hour drive. Sorry, that's just cool.
Spencer: So we were born in the same state?
McDonald: Yes, same general location.
Spencer: And in the same part, in the western part of the same state. How very nice!
Widener: I grew up in California.
Spencer: And you grew up in California.
Widener: The other side of the country but...
Spencer: Which part of California?
Widener: Orange County.
Spencer: Orange County. Oh, I know where the Crystal Cathedral is.
Widener: Okay, very cool.
Spencer: And that is in Orange County, isn't it?
Widener: Yes.
Spencer: My husband’s father owned an orange grove after he retired. He was a dentist out in Wisconsin. My husband went to the University of Wisconsin for his
undergraduate work. After my husband's father retired, his father bought an orange grove in Orange County.

Widener: I grew up in a town with a few orange groves. I'm from Yorba Linda—Yorba Linda, Anaheim area.

Spencer: I don't know the particular town but I have stayed in that county. I have former students that live nearby that have entertained me.

McDonald: So, you were born in New Castle. How big was your family? What did your parents do?

Spencer: My sister was 12 years older than I was. And, I was born—well, about two years after a physician murdered my grandmother. She was quite old. But that doesn't give a physician a reason to murder her.

McDonald: No. What happened?

Spencer: Well, it was in November, late November, and there was ice on the front porch, and you know these lovely people with their carts in Western Pennsylvania that bring in the—what do you call them? They have a name. Distinct but they were very—

Mascardo: The Amish?

Spencer: The Amish people. That's right. That's the thing I'm thinking of. They came in, and they brought our milk and butter and things of this sort, and left them on the front porch. Grandma went out to bring them in. And grandma always had a tendency to fall down a little more than other people did. But she always got up and everything was alright. That day she had a fall on the ice, and she felt bad enough that she went to bed. My grandfather had been a physician when he was young. In fact, it's a good story about how he met my grandmother. He was born on a farm in Mercer County, Pennsylvania.

McDonald: Oh, okay.

Spencer: And he didn't want to be a farmer. His father would have given him a farm but he wanted to be a doctor. And in those days, you didn't have to go to medical school to be a doctor. And, so, my grandfather went into town and heard that the most famous physician was Elisha Murray. And so he went to Elisha Murray's house and he said he wanted to become a physician. He stood in the hall and at the top of the stairs was my grandmother. She looked down at my grandfather and her father having their interview, and she said, "That's the handsomest man I've ever seen." She fell in love with him the instant she saw him.

McDonald: Cool.

Spencer: They were married, I don't know just how much later. I probably could figure that out. But in any case, that is how they met. And then he began going around with my great-grandfather on his rounds in the horse and buggy— that was one of the ways of becoming a physician in those days.

McDonald: That's really cool that your grandpa took the initiative like that to seek that out.

Spencer: So my grandfather did not go to a medical school for his education. And then you know what the awful people did in our Pennsylvania?

McDonald: What?

Spencer: They began to require that physicians had to have an education in a school or take an examination. And my stubborn grandfather absolutely refused to. Maybe he
thought he didn't know enough to, but I don't know. But anyway, what was he to do? He was determined not to take the examination.

McDonald: So, what did he do?

Spencer: Well, they didn't require a formal education to become a druggist, a pharmacist. So, he opened a drug store.

McDonald: Well that works. That's kind of cool.

Spencer: He ran that for a long time. And in his later days, he was an expert carpenter.

McDonald: A man of many trades!

Spencer: That's when I knew him. And, oh, he made all kinds of lovely things. Eventually, my grandparents had three children. Two boys and then one girl; the girl was my mother. She was born the same year Albert Einstein was.

McDonald: Oh, cool.

Spencer: Not quite the same day, but two or three days apart.

McDonald: That's awesome.

Spencer: She was born in 1879. She was 21 in 1900, wasn't she? She did very well in school. She wanted to go to college but what did my grandfather say? He wouldn't let her. She had an aunt who ran a boarding house at a college in a small town that was right near where we were born.

McDonald: Do you know the name of the school?

Spencer: She could have lived with her aunt and uncle and gone across the street to the college but Grandpa would not allow it. He said, "Girls did not have an education." You realize, of course, that our beloved MIT did not allow women to teach in the mathematics department until about two years ago [2007].

McDonald: Yes, that's what Professor Margery Resnick was actually saying. We were talking about that, and she said that it was really interesting that you got a degree in Math, because our Mathematics department didn't have any female professors.

Spencer: Oh, they were happy to have women as students. I think I was the second or third one that got a Doctor's degree there. I didn't know that at the time though. They were very nice to me as a student, but in order to teach, I've been commuting 88 miles since 1950.

McDonald: So, do you still live in Boston then?

Spencer: Yes.

McDonald: Interesting.

Spencer: I live in Boston. My husband was a professor at MIT. My son lives with me, and he is a research scientist in the Electrical Engineering department at MIT.

McDonald: Oh, cool!

Widener: So, you're like an MIT family. Aww!

McDonald: How did you meet your husband?

Spencer: Well, he got his Bachelor's degree and thought that the most wonderful position would be to work with Westinghouse, which is in Pittsburgh. Westinghouse is a very good company, and they make transformers. He got in the transformer design department, was there a year, and it wasn't very exciting work. He found that all they did was to look up the most recent—the most similar transformer that they had already designed, change a couple of details on it, and that was transformer design.

McDonald: Not exactly revolutionary.
Spencer: But he had a lab partner named, Ernie Guillemin, from Wisconsin. Ernie had an assistantship at MIT and he kept writing to Parry about how wonderful MIT was. And Ernie said to Parry, "Why don't you apply for a position here?" And so, this was about 1923, something of this sort- Parry got to be an assistant to a young man who had just gotten his Doctor's degree—you probably have heard of him—Vannevar Bush.

McDonald: Oh, cool.
Spencer: He was later President of MIT.
McDonald: Wow.
Spencer: But at that time, he was just barely a young assistant, didn't know everything he might have known. What he did know was that Einstein's Theory of Relativity was something he questioned. Now, it hadn't been around very long then, about 20 years or so. And he met Parry, my husband. Years later, we were married in when was it? 19...

Spencer: 1960?
Spencer: 1961?
Mascardo: Yes.
Spencer: See, she knows things better than I do.
Mascardo: My parents were born, I mean, married, the same year.
Spencer: And he told Parry, that he was to disprove Einstein's Theory of Relativity by an experiment that he wanted him to do. And I have never been able to find out the details of the experiment. If you wish to do research, you can probably look in the archives and find out what the experiment was. I've never done that. It would be interesting. There must be something written on it.

McDonald: Yes, there should be something somewhere.
Spencer: Anyway, he set Parry to work on it. And, it involved something that sounds to me like obviously something that you wouldn't do. I'm not primarily an experimentalist, but I think I would know enough to be cautious with gunpowder. And he was told by Bush—the young Doctor Bush, the young Professor Bush—that he was to put this in a mortar and pestle. Do you know what that is?

McDonald: Yes, it's where you mash up pharmaceuticals.
Widener: Yes.
Spencer: And he put gunpowder in there and ground it.
McDonald: Yes, great idea.
Spencer: Great idea?
McDonald: Not particularly.
Spencer: Well the next thing he knew, it exploded. And he was burned so black from head to foot, that when he was taken—someone found him, I don't know who found him—when he was taken to St. Elizabeth's Hospital, a good Catholic Hospital—this is about 1925—and they saw that he was black, so they brought him into the emergency room and just left him there. They didn't try to do anything for him. Not a thing. He was black from head to foot. Black people weren't worth saving.

McDonald: That's interesting. But somehow he got treated?
Spencer: The head of the Electrical Engineering department was then a man named D.C. Jackson. You know about the Jacksons? There were two brothers, D.C. and A.C. Jackson (Laughter).

McDonald: That's excellent.

Spencer: And the one that was head of the Electrical Engineering Department that hired Parry was D.C. Jackson. And somehow, he found out about the accident and that Parry had been taken to the hospital. He came charging over there and came in and yelled at them, "This is the brightest young man we have at MIT. You've got to save him!" And they went to work on him then. He was in the hospital six months and they did all kinds of operations on him. He lost his left eye completely, but his right eye was perfectly alright. And when you went swimming with him, you noticed these things: he had some scars under here and on his chest and some others on his upper legs where they had taken out strips of flesh to put in other places. But he looked pretty fine. He lived to be 90.

McDonald: Well, he lived pretty long.

Spencer: It wasn't long enough, but that was pretty good.

McDonald: Now, you guys were married in 1961. But when did you meet?

Spencer: Well, I told you now that's what Parry was doing in the 1920s. He then went to work in something just as dangerous, in a different field, in Electrical Engineering. He eventually got into working illumination and was in charge of the lighting design program in Electrical Engineering which was a big program for many years. It then became something that primarily architects took in the last years. We won the gold medal of the Illuminating Engineering department—the Illuminating Engineering Society in the early '70s. And, we did a lot of work in illumination for many years. But, now where did I come from?

McDonald: Yes.

Spencer: Pennsylvania. We lived on Highland Avenue, at 1005 Highland Avenue. From the name of the street, you can picture it-- New Castle is built on seven hills. Our church was down at the foot of it, downtown. And my father's furniture store had been on the corner of the diamond that was the center of downtown New Castle. New Castle had about 100,000 people in it when I arrived.

Widener: I guess it gives a new definition to downtown and uptown (Laughter).

Mascardo: Good one.

Spencer: But, we had this beautiful home. And my sister was twelve years old, almost thirteen when I was born, just a month short of thirteen. People had told her, "Isn't it a shame you're an only child?" before I was born. Twelve years, that's a long time. Mother wanted to have one child and educate that child. Mother had not been allowed to go to college. She was allowed to take a business course and had worked in the furniture store, in the office of the furniture store that my father owned. That's how she met him. And he convinced her to marry him, eventually. But she was determined that her daughter, my sister Vivian, would have an education. And, well, she had private tutors. She didn't go to a regular school; she had private tutors all the time. And, when I was born, what did she do?

McDonald: Hid you in a closet?
Spencer: She started teaching me things. She had said she didn't want a little sister. I was telling you what she used to say. She said that if mother had another baby, she'd take it up and throw it out the attic window. But she did not do that to me.

McDonald: Well, that's good.

Spencer: That was just something she said when people were sorry for her because she was an only child. She thought being an only child was great. They did everything for her. I mean we had a beautiful home up there. It was almost a whole city block with a big yard and a garden and a lake that we had a lot of fish in. And then my grandfather had built a pool, an indoor pool, and an aquarium that was about this big. I can remember standing beside this when I was very little. You could look through it, right into our conservatory, which he had also built onto the back of the house, where we brought all kinds of plants in for the winter.

McDonald: Oh, cool.

Spencer: And brought our fish in, and they swam around. You could be in the dining room enjoying them, and well it was warm enough to keep them safe. It was a very, very nice home we had.

McDonald: Sounds lovely.

Widener: Is it still there, do you know?

Spencer: He put it in my mother's name. Yes, the house is still there. I've visited it in the last ten years.

McDonald: Oh, okay.

Spencer: But he put the house in Mother's name. That is very important.

McDonald: That's interesting.

Spencer: You remember women didn't have much of anything then. My mother had gotten to be a bookkeeper or something of the sort in his furniture store. She wanted to be more than that. And, when I was born, Vivian was allowed to be right in the room. Well, I'll start back a little bit. Mother taught at the Presbyterian Church. She taught the class of about 50—I don't know how she handled 50—little, tiny children (Laughter).

McDonald: She had a lot of patience, I bet.

Spencer: Well, she did that the day I was born.

Widener: Wow!

McDonald: Oh, really. That's intense.

Spencer: In the morning, my mother, father and grandfather, walked up the hill—about a mile.

McDonald: Nine months pregnant and walking up a hill. I don't think people do that anymore.

Spencer: My husband walked to MIT all his life. That's why we live in the city instead of having a house further away. He wanted to walk to work every day, and I think that's one of the reasons he was so healthy.

McDonald: Probably.

Spencer: It was good for him. Good exercise. I have walked from where we live to MIT on a number that you could count of my left hand—maybe two or three times.

McDonald: How far away is your house from MIT?

Spencer: It's about an hour's walk. You go into Boston and walk across the Harvard Bridge and you're there.

McDonald: It's a bear in the winter time.
Spencer: But it's a good walk. Anyway, Parry was in the Electrical Engineering Department. And, oh, I'm just getting born. Then, mother cooked a big Sunday dinner for everybody and fed it to them. And sometime, maybe about 3 o'clock Sunday afternoon, she told my father he should go out and find the doctor. No telephone yet. And so he did. And so the doctor came back, and I was born at 5:20 in the afternoon.

Mascardo: Oh my Lord, I thought you were going to tell them how you were conceived (Laughter).

Spencer: And as soon as they could get rid of the doctor, my sister took me in her arms and told me about Jesus. She showed me a little picture that we have hanging in my bedroom now, about this big with a gold frame. Probably I was attracted by the gold frame, but it has in it a very nice painting of Jesus and John the Baptist as babies. So, I claim that I was made a Christian when I was about two hours old. Anyway, my sister wanted to teach me everything. I cannot remember learning to read. I know I knew how to read by the time I was two.

McDonald: Wow, that's impressive.

Spencer: And I just have no recollection of learning to read.

McDonald: That's really cool.

Spencer: And my sister kept teaching me and teaching me and teaching me, and meanwhile, she was getting older. And she was old enough to go to college. And Mother investigated all these colleges. And she decided that Oberlin College was the best college because it was the first co-educational college in the whole country. In 1833, Johann Fredrick Oberlin, a minister from Germany, formed a college and let women in immediately when it was founded.

Widener: Is that in Ohio?

Spencer: It's in Ohio. It's near Cleveland. It's about an hour or two drive to Cleveland, maybe 30, 40 miles, something like that.

McDonald: So it was about three hours from home to go to Oberlin?

Spencer: It's not far from New Castle. Far enough—about four or five hours drive from New Castle.

McDonald: Four or five, okay.

Spencer: Just, it's near Lorraine and Elyria in Oberlin, in Ohio.

McDonald: Okay. I know where that is.

Spencer: And so when I was four years old, my sister was 16 and it was time for her to go to college.

McDonald: That's young, isn't it?

Spencer: No one in my family had been to college. My father had a third grade education, and then he went to work. Mother was determined. The house I was born in was her house. She didn't have any money, but she did own the house. So she sold the house, and that's where the money came from to pay for my sister's college education. We thought at that time that it was unthinkable to apply for a scholarship. We didn't realize that many people apply for scholarships. But, we sold the house when I was four years old and moved to Oberlin. And my sister continued teaching me in vacations. I thought vacations were wonderful because my sister taught me mathematics in vacations. And I thought it was great. And
that is why I didn't take any course in mathematics until I took Advanced Calculus at MIT.

McDonald: Oh really? That's interesting.

Spencer: You see, I escaped from being taught to learn elementary mathematics. And, I had a wonderful time in Oberlin. I started to study music at the Oberlin Conservatory. When I was six, I started to learn piano and at seven, I added violin, and when I was nine I added the flute.

McDonald: Wow.

Spencer: I didn't go to school. My sister would teach me the year's work in a week or two in vacation. I did an awful lot of reading. They had a wonderful children's library at Oberlin College. And of course, I was determined to go to Oberlin myself.

McDonald: What did your sister study in Oberlin?

Spencer: But, as you know, I didn't. What happened was that my sister got a position after she got her Master's in Mathematics at Oberlin with this wonderful woman Mary Emily Sinclair. If you want to look up early women in Mathematics, you might want to study Mary Emily Sinclair. She was the first women to get a Ph.D. in Mathematics at the University in Chicago when it was founded in the 1890s. Something like that.

McDonald: Wow.

Spencer: And she was eventually head of the Mathematics Department. And then, so I was studying at the conservatory and when my sister got her Master's degree, she got an assistantship at the University of Pittsburgh and taught Mathematics and took more courses there. And she was there for four years. But in those years, in the summers between them, she studied Mathematics out there and got a lot more credits. She had mother and me spend the summer in Chicago with her. And so I got to spend three summers out there in Chicago with her. We got to Chicago. But my sister had wanted to go to a better school than the University of Pittsburgh to get her Ph.D. She didn't think it was as strong as some other schools. So she applied to various schools, and the one she got a fellowship at was the University of Pennsylvania in Philadelphia. And that's how I get across the state.

McDonald: Oh.

Spencer: When we had been out in Chicago—in Oberlin, there was one church that was the prominent church, a Congregational church. There was also a Methodist Church. And an Episcopalian church, and there was a very small Catholic church in Oberlin. It was primarily the Congregationalists that had founded Oberlin College. And, when we were out in Chicago, particularly the last summer that we were out there, why we saw so many different churches of so many different denominations that we decided it would be fun to go to a different one every day.

McDonald: Oh.

Spencer: And every Sunday, we tried them all.

McDonald: Did you like one in particular?

Spencer: Well, we had never been to a Friends Meeting. But my mother's interpretation of Christianity was that you don't kill. Around the time she was—around 1900—she was old enough to decide things—21—why, she read the works of Tolstoy and George Bernard Shaw and decided to become a vegetarian. And the rest of the family became a vegetarian too because of her. And she also believed that when it
McDonald: says in the Bible...when Jesus was summarizing Christianity, what did he say? “Do unto others as you would that they should do unto you.” Who are “others?”

Spencer: Well, mother said, "others" were anyone that can receive your love.

McDonald: I like that.

Spencer: Therefore, you don't eat them. And you don't kill them. And during the First World War, there was mother teaching her big Sunday school class that it is wrong to kill people even in war times. And there was our minister, "Son of God, go forth to war." Totally different. But my mother said, "No. If you love these people, you don't kill them." And so she stuck to that, all through the First World War. We had never been to a Friends Meeting. We knew that William Penn had founded Pennsylvania, and it's about the only state in the Union that had peace with the Indians, all for hundreds of years.

McDonald: Yeah, Pennsylvania!

Spencer: So, we went to a Friends Meeting out there, and there was a little old man with a white goatee that got up—we'd never been to a Friends Meeting before—and he got up and gave absolutely the most beautiful sermon you would ever hear. We had no notion of who he was. But, my sister had gotten a fellowship at the University of Pennsylvania, and none of us had been to Philadelphia before. Pittsburgh, we went shopping in regularly. Your family went shopping in Pittsburgh when they wanted to buy things, didn't they?

McDonald: Yes.

Spencer: That's what we did. Took the train to Pittsburgh. And so we came to Philadelphia with Vivian, my sister, to see what it was like. And she rented a tiny apartment near the university. One of those one rooms with an inner door bed. You know the kind of bed that folds up and goes into the closet. And it had a nice kitchen and a dinette. And we went walking—we didn't have a car then—all around Philadelphia to try to see the sights. And when we went walking, we went over—do you know Philadelphia at all?

McDonald: Very vaguely.

Spencer: Well, you know William Penn?

McDonald: Yes.

Spencer: His statue is on the top of the tower on the city hall, and about two blocks from that we found a high wall around a city block. And there was a gate at one end of it. And it said something that seemed to us like an awfully funny name. It said, "Friends Select School." But we walked in, and we walked up the steps and into the front hall. And we were standing there looking at a beautiful old clock, a grandfather clock. And out from the office, just behind us, came the little old man that we had heard speak so beautifully in Chicago.

Mascardo: This is your last school picture. Remember, with the 300 year anniversary.

Spencer: It is nice to see that again.

McDonald: I should tell you too, while we're doing this—

Spencer: That was from the 300 year anniversary of Friends Select School.

McDonald: I brought a camera with me.

Spencer: Terri was down in Philadelphia to attend that with me.

McDonald: Cool. I was just going to tell you that I brought a camera so if there's anything that you'd think I should take pictures of; we can put them in your file with the
interview and stuff, too. So, just as an aside, if you think of anything, I have a
camera; we have the power.

Spencer: Alright. Well there is 300 years ago, the founding of Friends Select. And our
discovery of it was much later, when I was 12. And when Master Walter—What
was his name? Walter Haviland was his name, and we called him Master
Walter—when he discovered I had never been to school and was 12 years old, he
begged us to let me come to Friends Select just while I was visiting there. Well, I
went four years. (Laughter). It was a wonderful school. And I took Latin, which I
loved, and French, which I tolerated.

Mascardo: There's your Latin book right here.

Spencer: And a science course which I loved. The best thing about that was the teacher
Master Charles was also the riding master. He owned a ranch in Wyoming, and he
suggested I go on a riding class on Saturday mornings and learn to ride horses.
Somewhere she has a picture of me on my favorite horse, Jim.

Mascardo: I think it's on that shelf over there.

Spencer: We'll show it to you at some time. I learned to do horseback riding at Friends
Select. And I learned Latin, which taught me more about thinking than anything
else did. And I never took Mathematics because we told them that I knew all of
Mathematics already.

Mascardo: Which was true!

Spencer: They didn't examine me. They didn't ask me to prove that I knew it. We just told
them I did, and they believed us. And a lot of history. I had a wonderful history
teacher. And it makes me feel guilty if I don't know everything about what is
going on in Washington.

McDonald: There's a lot to know.

Spencer: It's very interesting now. And then, no MIT yet, but I took high school chemistry
and loved that.

McDonald: Patricia's excited.

Spencer: High school Physics and loved that.

McDonald: Yeah, Physics!

Mascardo: Oh, you must have a phenomenal memory.

Spencer: And then, after the summer, after my junior year at Friends Select, my Vivian got
the idea that it would be fun--she had a boyfriend that had gone to Harvard and
taught her that Harvard was the only school in the country and that girls couldn't
attend, except at Radcliffe. So, that didn't exactly count with us. And...

McDonald: So you're saying her boyfriend lied to her?

Spencer: So, Vivian got the idea that, I could go to summer school the summer I was 15 for
fun at MIT.

McDonald: School for fun at MIT?

Mascardo: Yeah, right.

McDonald: Okay.

Spencer: You know that's what you go to MIT for, to have fun.

McDonald: Of course, of course. That's exactly it...sort of.

Spencer: I was quite stupid then. I had just had Physics in my high school, and I thought I
knew everything about Physics. And, what my sister suggested I take was the
freshman course in Physics at MIT that summer. It was a year--two semesters in two six weeks.

McDonald: Wow! Just pack that in there.

Spencer: I had a couple of weeks after classes were over that I could have learned something in--Calculus, for example. My sister tried to tell me that it would be useful to learn Calculus. And I errantly told her that they don't use calculus in Physics and absolutely refused to let her teach it to me. They didn't in the Physics I had seen. And I got up there and got in a class, now it was maybe 20 people or something like that. The lab partner that I was assigned to couldn't speak much English. He was from—his name was Francisco Del Rio. And he could speak Spanish, but I'd only had French and Latin.

McDonald: Doesn't work out so well.

Spencer: But we found however that we had both studied some French and we could communicate better in French than in English. And we got along for the first week with no Calculus and then the next assignment, this is about the third week in June...then the next assignment...I went up and told my teacher I understood everything except this symbol: an integral sign. And he told me that's an integral sign. And I called my sister up and told her, "They do use Calculus!" You ever hear of anybody so stupid?

Widener: Yes, myself.

McDonald: And (points fingers at herself).

Spencer: Fortunately, my sister was planning to come up for the 4th of July weekend. Over the 4th of July weekend, she taught me enough Calculus to survive in Physics.

McDonald: Wow. That must have been a very intense weekend.

Spencer: That was my beginning of college mathematics. I did survive. I had a man who later got a Nobel Prize to teach me the second semester, and he taught me something about heat, and then I went back and had my senior year at Friends Select. And I had always intended to go to Oberlin College because I thought it was so wonderful. And I had applied to it in my junior year and they didn't give me advanced admission. Then I saw MIT, and the other thing my sister did at the 4th of July visit was to discover the nautical association and that I would be eligible to learn to sail on the Charles River.

Mascardo: Wait a minute! You applied to Johns Hopkins, too. Remember?

Spencer: Hmm? Yes, I applied to Johns Hopkins, too. I didn't get in at all. And applied for advanced admission at Oberlin and didn't get in, in my junior year. I never bothered to apply for Oberlin in the senior year. By then I was thinking only of MIT. I had learned to sail. My sister took me down that first 4th of July that I was in Boston. She bought me a beautiful pair of navy blue slacks, a little white top with nautical things on it, and a little blue jacket. And there were free sailing lessons. And I passed them. First, I was crew, and then I was a helmsman. Then I was a racing skipper and could race in the races. And the first race I got to be in of the grown up races, the really good ones was on Labor Day. And I went sailing there, and I had studied the rules, and I was argumentative. And somebody hit me as I was about to round a buoy. And so I filed a protest and we had a meeting afterwards. And I discovered that the man I had hit was Karl Taylor Compton, the President of MIT (Laughter). And I was protesting him. Isn't that stupid? I didn't
know who he was. And it turned out he was correct and I wasn’t. But, my senior year, I only applied to MIT. I didn't think of anybody else. And I applied for a scholarship. And they did admit me. I was something like third in my class of about 35 students. And, they admitted me, and they gave me a scholarship—of fifty dollars (Laughter).

McDonald: Well, how much did it cost to go to MIT then?
Spencer: The tuition then was five hundred.
McDonald: It's 50,000 now.
Spencer: I know.
McDonald: Fifty dollars wouldn't go as far.
Spencer: They've moved the decimal quite a ways. They liked the five.
McDonald: Yes, they liked the five.
Spencer: I know. Fifty dollars they gave me for a scholarship out of 500. And I was brave enough to go to see the director of admissions to ask him why I didn’t get a decent scholarship. And he told me women were a bad investment.

McDonald: Interesting.
Spencer: Remember at that time they had very few women there. I had only one class in the five years I was there that had more than one woman in it. And not all of them by any means had any women in them. There was one class, when I took Relativity with Professor Vallarta—he was a very good professor—that had four women in it. But that was the most women that I saw at MIT.

Mascardo: Wow. What’s it now?
Widener: It's very close.
McDonald: It's like forty-six. Yeah, we're just under half.
Spencer: And you have almost fifty percent women now, don't you.
McDonald: Yeah, it’s just under half. It’s like forty-six percent women.
Spencer: Forty-six percent.
McDonald: We were just talking about that now (Laughter).
Spencer: Well, I did get into MIT, but I didn't get much of a scholarship. And so I began. And it was hard for my sister to raise the money for a scholarship, and my father was having—selling specialty advertising by then, he had lost his store—his furniture store. Do you know why?

Widener: The Great Depression?
Spencer: No. He lost it because he ran for state senator in Pennsylvania on the socialist ticket. He believed in things like old age pensions and unemployment insurance, which were sinful then. And so the banker—and there was only one bank in New Castle at that time—and the banker refused to deal with him and he lost his furniture store because of that, too. He couldn't run the furniture store without a bank. So he went into selling specialty advertising to various stores. During the Depression that was not the best business to be in. It was very difficult because it was something stores didn't absolutely have to have.

Mascardo: Do you want more to eat?
Widener: No I'm fine. Thank you.
Spencer: So we were having difficulty paying the tuition. So I studied the catalogue and figured out how I could get a degree from MIT, a Bachelors’ degree, as rapidly as possible. And I discovered—do they do this still at MIT, or not?—that you could
take advanced standing examinations in any course you like, and it didn't even cost
one red cent to sign up for them.

McDonald: Yeah advanced standing exams are still free, but you can't take them for
everything.

Spencer: Well, I found that you could take them for almost everything that you could think
of at that time. I remember one day—on my birthday—when I took two advanced
standing exams, a three hour one in the morning and a three hour one in the
afternoon, and there was a half semester of MIT credit in one day!

McDonald: As long as you can pass them (Laughter). I took some advanced standing
exams...didn't do so well.

Spencer: Well, I did pass them all. I have no notion what grade I got. They didn't tell me.
It was pass or fail. And I did that with a number of things and by that ruse, I got
through MIT in two years instead of four.

McDonald: Wow.

Widener: Phew.

Spencer: The first year—the second year I took all of the required courses in the junior year
and senior year of physics simultaneously.

McDonald: Wow.

Spencer: Those were really the sensible, easy courses. Not a lot of memory sections in
them. I had Stratton and I had Vallarta. Those were the two best professors I had
in physics. I did my Bachelors' thesis with Stratton on the reflection of
electromagnetic waves from the clouds.

McDonald: Interesting.

Spencer: And it was nice and fun. That was the year he was writing his book on
electromagnetic theory, and busy having his youngest daughter born, too.

Widener: Is he busy, or is his wife busy? (Laughter)

Spencer: He was home with her most of the time. I think he had a sabbatical leave or
something of the sort, but he came in to see me to talk about the thesis every now
and then. I spent most of my time standing outside his door, waiting for him to
come. But Stratton was nice. I liked him. And, and then, I decided to—I had
considered going to Johns Hopkins for the graduate work and I was admitted there,
but I didn't want to leave MIT, and the sailing, in particular, was what I liked the
best.

McDonald: Were you on the varsity sailing team?

Spencer: Yes, here is my bracelet that proves it, one of them. And she [Terry] has other
things. Well, there weren't many women at MIT that were in sailing. That's MIT
you know. M-I-T. And this is F-A-L-L, the fall of '72. Uh, '42. Um, wait a
minute--

Widener: '41!

Spencer: '41. That was my senior year, the year I was taking my junior and senior physics
courses. But I went sailing every Saturday and Sunday afternoon.

McDonald: Cool.

Spencer: And, in season, and I loved the sailing. And so I came back as much for the
sailing, as anything else.

McDonald: Hey, everybody has their reasons.
Spencer: And, anyway, I had the opportunity to go to Johns Hopkins, but I really didn't want to leave MIT. And so I went over at the beginning of September to the head of the Mathematics Department, who had let me get away with taking advanced calculus the first year I was there to fulfill all my mathematical requirements. And I had done well in that. It was an easy course. Mathematics is easy. And—at least my sister taught me it was—and...I walked in there and they let me in the Mathematics Department. And I told them I wanted to take Norbert Weiner's course. Did you know Norbert Weiner?

McDonald: I don't think so.

Spencer: He was the most famous mathematician at MIT in those days. He had—I had—

Mascardo: Here is his book.

Spencer: I had had lunch at the mathematics society meetings once across the table from him and his two daughters that looked exactly like him, except without the beard. And I had heard that he was the greatest mathematician—one of the greatest ones in the world. So I went over to MIT and told them I'd like to do graduate work in mathematics and take Norbert Weiner's course. And the head of the mathematics department refused to let me take Norbert Weiner's course and said I had to take a course with a man named Struik. And I had never heard of him.

McDonald: So what did you do?

Spencer: I took Struik's course. I discovered later that, according to the head of the Mathematics Department, Norbert Weiner was the worst teacher in the department. He was very good for students that were doing research with him, but to teach other people, what he did was required no work, he walked in and he gave everyone whatever was the equivalent of a B. I think it was a different scale in those days: H, C, P. I think he gave everybody a C in the course, which is equivalent to a B on the other scale.

McDonald: The scale was H, C, P?

Spencer: I was forbidden to take a course with him.

Mascardo: H was high pass, right?

Spencer: Hmm? H was the highest grade, an A.

Mascardo: And what's C? C was a B?

Spencer: C was a B. And P was a C. (Laughter) Anyway, I was told I could however get in as a special student for a semester and then they would see how I do. But I had to take this course. The subject matter sounded absolutely horrible to me: Absolute Differential Calculus. With a man named Struik! And he turned out to be the best teacher I ever had. And I did my Masters' and my Doctor's theses with him. Our most recent book is dedicated to him,

McDonald: Cool.

Spencer: Struik was wonderful, and he lived to be a hundred and six.

Widener: Oh, wow.

Spencer: The oldest person I have ever known personally. And he came down to the University of Connecticut to give us colloquia every year until he was over 100 and his daughters told him he couldn't travel anymore.

McDonald: Well, you know, once you're over 100...

Spencer: I was with him—his birthday happened to be four days after mine in September. And I was with him the day before his 106th birthday. That was the last time I
ever saw him. I brought him a birthday present that day, which was a book on women mathematicians that had his daughter, Struik's daughter, who is his oldest daughter—he had three daughters, but it's the oldest one became a mathematician at the University of Colorado—and she was...my picture's on one side of the page and hers is on the back on the same page in that book.

McDonald: That's cool.

Spencer: I gave him that for his birthday the last year.

McDonald: I bet he liked that a lot.

Spencer: I hope he did. But I have a nice picture that somebody took of me giving it to him. That's the last picture I have of Struik. By the way, MIT did finally give me a scholarship. The next year, I had a half a scholarship and the last year they gave me a full scholarship.

McDonald: Good.

Spencer: And, my advisor, Ted Martin, he told me I shouldn't take any courses that year. I had all the courses I needed. And I told him, "You mean you've given me finally a full scholarship, and you don't want me to get anything for it?" And I got away with violating his recommendations and I took a very full schedule and the courses I took—well one of them was the electrical engineering course in lighting design with Professor Parry Moon. And the other course was a very, very good course in electrical engineering. And that was a wonderful year. And then they finally gave me a doctor's degree and I had to look for positions. But that was the year I met Parry, and, um, we began doing research together, and we've done eight books so far and we have a ninth one that Terri is co-author on.

Mascardo: They're all over there.

Spencer: That we sent in to Cambridge University.

Mascardo: Springer. Springer.

Spencer: No, no, we sent to Springer-Verlag. It's just about 6 months ago now.

Mascardo: October 21st, I finished it.

Spencer: And, they haven't said whether or not they'll accept it. They always go that long.

McDonald: Ok.

Spencer: They'll get around to it. Probably they've sent it to some professor who's been too busy to look at it until school is out.

McDonald: That's probably true.

Spencer: That's very likely to be true. But, and we've had a wonderful time doing research in many fields.

Mascardo: When you were a freshman at MIT, it was only sailing and fencing that women could participate in, right?

Spencer: Hmm?

Mascardo: Sailing and fencing were the only sports that women could participate in?

Spencer: Oh, yes. Nothing else.

Mascardo: That's her fencing jacket over there.

McDonald: So you did both?

Mascardo: And that's her épée on the wall over there.

Widener: Oh, wow.

Spencer: Well, nothing was...Women weren't supposed to be there. On the other hand, they treated me pretty well once they had me there.
Mascardo: You've got to tell them that story about—here, I should show them this—about Harriet Aldrich. Harriet Aldrich was a Rockefeller, and um, what did she do? She had her car painted MIT colors. It was—It was really funny 'cause...

Spencer: Oh, yes she had a lovely car that was all red and grey.

Mascardo: I had a copy of the bottom part of her scrapbook, and a friend of mine who has another company that was like my company, she's—somehow she came across on the internet on this social register or something, she said, "Did Harriet Aldrich go to MIT?" And I said, "Yeah." So she says, "I just found her birth notice." And I'm like, "Well, copy it, and I'll put it together with this."

McDonald: That's cool.

Mascardo: But, so didn't you say—what was it?—she dropped out to get married or something.

Spencer: That's right.

Mascardo: In those days, they called it the MRS degree.

McDonald: Yeah, my Dad was teasing me about that.

Spencer: Well, it, MIT's a wonderful place, I think. I loved it, particularly the sailing.

McDonald: So you did sailing and fencing. I have some questions about how MIT was when you went. Where did you live? Because Patricia and I—

Spencer: Well, um, there were no facilities for women then.

Mascardo: Where do you guys live? Do you live on campus?

Spencer: We lived at 410 Memorial Drive. You probably know where that is. You go down Memorial Drive, away from MIT.

McDonald: Ok.

Spencer: Along the Charles. There are some fraternity houses there and some new things that have been built since I was there. And then there's an apartment house that MIT now owns. It didn't own it then. It's five stories high and we had an apartment on the fifth floor, in the front, mother and I, and we lived there.

McDonald: So your mother lived with you while you were in college?

Mascardo: How far is your dorm from campus?

Widener: We're only—we're in the other direction.

Spencer: It was great.

McDonald: That sounds awesome.

Mascardo: So that's by choice, that you live in an all girl dorm.

Widener: Yeah.

Spencer: And, my little Chihuahua. We had a little Chihuahua named Don Pedro Ponchito. He was our first one. Donnie, we called him. And the next one was Popocatépetl. We named him for the most volcanic mountain in Mexico.

McDonald: Oh, okay.

Spencer: Called him Popo. And it was the perfect name for him. He was the most unfriendly Chihuahua of the six we've had so far, but he wouldn't make up with anybody, except us. He loved us. I had one friend who used to come over and study with me sometimes. He would give him malted milk tablets, which he liked very much. Horlick's Malted Milk Tablets, they're little things about this big, and he would get just within arm's length so he could get it and then run away as fast as he could.

McDonald: Cute.
Spencer: And when I looked for a position, then my first position was when I was 21, I was head of the physics department at American University in Washington.

McDonald: Oh.

Spencer: And then I got a position at Tufts, so I could be where Parry was at, at least in the town. And I taught at Tufts for four years, and then I went to Brown for three, and then I came to Connecticut. And when I came to Connecticut, they doubled my salary, gave me an associate professorship and gave me tenure immediately, as fast as they could get it through.

McDonald: Wow!

Spencer: Which was nice. (Laughter) It was very nice to have tenure.

Mascardo: Yeah, you were only 30 then, right? 29?

McDonald: Wow, that's impressive.

Spencer: But, we've had a lot of fun. I've done a lot of driving, a lot of commuting.

Mascardo: You can't have this interview without telling some of the other things that you did. Like on Building 10, right? What did you do on building 10?

Spencer: Building 10?!

Mascardo: Come on, you have to start warming up to the guests here.

Spencer: Well, I climbed up there a few times. (Laughter)

McDonald: Were you a hacker?

Spencer: What did I do up there?

Mascardo: On Building 10, 'cause this is for archives now. You have to distinguish yourself. What did you do up there now?

McDonald: On the Great Dome?

Spencer: Well, I think somebody took my picture up there.

McDonald: Took your picture! Well, it was a special picture, a special kind of picture.

Spencer: Yes, it was one in which I didn't have much clothing on. On top of Building 10.

McDonald: You know, if you're going to do it somewhere...

Mascardo: Why not Building 10? Yes, see I bet you were the only woman back then, you know? Everyone else hanging out in the Mary Cheney Room and you're on top of Building 10.

McDonald: The Mary Cheney room is still there.

Mascardo: It's still there?

McDonald: Yes.

Mascardo: Wow.

McDonald: It's like the women's lounge area. They even have beds and showers and stuff.

Spencer: But most of the time, we did a lot of good work in lighting design. Our first research was using integral equations to study all the possible ways in which you could design the lighting in a room. And, it's basically indoor reflections of light, and you have to use integral equations--You know what an integral equation is?

McDonald: Mhmm.

Spencer: And we, did papers in which we studied all possible ways and found that the best way to make the floors light as possible, light for floors—maybe 30 percent or—at least 10 percent, between 10 and 30 percent reflective and make the walls lighter than that, 50 percent, at least. And then the ceiling as light as possible and make the entire ceiling your source of light. And we have these in our apartment, in all the rooms in the apartment. And, uh,
Mascardo: Domina, do you want to sit on the sofa with them, and show them your yearbook? And then, they might have—

Spencer: Can I finish my ice cream first?
Mascardo: Oh, I didn't know you weren't finished.
Spencer: You know, they keep me talking all the time.
Mascardo: When they see the things about the war—they'll probably want to ask you more questions about during the war time or whatever it is that you have in there. Would anyone like any water or anything like that?

McDonald: No, I'm pretty good.
Widener: I think I'm well hydrated, thank you. (Laughter)
Mascardo: Right, yeah.
Spencer: And outside of the fact that I spend an awful lot of my time driving, I've had a wonderful life.
McDonald: Cool.
Spencer: People in Connecticut are good to me, and I'm lucky that they let me teach this long.
McDonald: Yeah, Patricia and I were both pretty surprised when we saw that you were still teaching.
Spencer: Hmm?
McDonald: Patricia and I were both really surprised when we saw that you were still teaching. I mean, I guess astounded would be the better word.
Spencer: Well, it's fun. And, they do very well on my salary, and probably because I've taught so long, I think I have, way, way, by a factor of two I think, the highest salary in the department. So, they're doing alright by me, except that I probably spend it all on gasoline.

Mascardo: You guys know what you want to do? Or are you just kind of undecided and you'll decide that later on?
McDonald: Well, I want to do something like international humanitarian work with my Mechanical Engineering degree. I don't know how exactly that's going to play out yet. I might work a real job, and then have that as my all inclusive hobby and then take my vacations overseas. Or I might work for an NGO eventually. I haven't really decided yet.
Mascardo: How about you?
Widener: I want to teach high school. So, we'll see.
Mascardo: That's great. We need a lot of good high school teachers.
McDonald: That's true.
Mascardo: So do you want to sit on the sofa and show them your yearbook, I mean your scrapbook that you put together?
Spencer: Sure, we haven't eaten everything on the table though.
Mascardo: Well, you can come back...
McDonald: I'm not sure we're going to be able to eat everything on the table.
Mascardo: I know, if she had it her way, she'd eat ice cream for breakfast, lunch, and dinner.
Spencer: That was very good.
McDonald: There is nothing wrong with that.
Spencer: The apricots are for Nikki. Nikki loves them.
Mascardo: That's what I put them there for.
McDonald: Super cute.
Mascardo: I sort of waiting for her--to have her beg first. So, Domina, why don't you show them all the stuff over here? You guys can sit where ever you want.
McDonald: Let me go grab my camera.
Mascardo: Sure, sure. Why don't you sit in the middle, and then they'll sit on either side of you.
Spencer: Alright.
Mascardo: This is where MIT starts, right here. That's you when you're what, 15 or 16?
Widener: Why'd they call them smokers?
Spencer: When I was student, there were people from the tobacco companies handing out free cigarettes to everybody when you walked in the front door.
Mascardo: And they called smokers?
Spencer: And they called every public meeting that you had at any organization a smoker. You know, we have improved a lot since then.
McDonald: True, hardly anybody smokes on campus anymore.
Mascardo: Really?
Spencer: That's wonderful.
McDonald: It's, well, I mean I think it's mostly staff members.
Spencer: Well, this is a picture of me on horseback, and that is Jim (points to the horse), and there's the city hall and this is Friends Select School. And there is my beautiful black horse and I was in a horse show, where I won a prize in. It was held at Friends Select. And this is about the ballet thing I won when I was a little girl. And this is, they have the people labeled wrong. All the names are in the wrong way. But the, I told you Friends Select was surrounded by a brick wall. There is the brick wall, and the tennis courts that we had out there froze over, and we had a skating rink. Can you tell which one is me?
McDonald: Let me think about this, you're...
Spencer: Don't look at the label because it's wrong.
McDonald: I'm not looking at the label because it's wrong.
Spencer: Nope.
Mascardo: And she still has that hat.
Spencer: I still have that hat.
Widener: Oh, wow.
Mascardo: She still wears it.
Spencer: I know exactly where it is at home, too. And this was still at Friends Select and this was some artwork I did for some kind of a May Day thing they had. And there was a picture I drew of our cat, Mossy. And there is I think the picture that's in my class, my senior class things at Friends Select. There's my sister. And there am I somewhere in the, I think over to the left. And there am I painting.
Mascardo: Is that on the Charles, Domina? Domina, is that on the Charles, right there?
Spencer: No, this is at Friends Select...
Mascardo: Oh, that's at Friends Select.
Spencer: I spent all of my time in the outdoors. It was fun, and the horseback riding was fun. And then, you see this, and I hated this thing, "Smoker Last Night" but there am I, sitting in the front row, and this was an affair they had to greet the incoming freshmen.
McDonald: So, these were all the girls that came your year?
Spencer: Hmm?
McDonald: So these were all the girls that came your year? Nine of them?
Spencer: Yeah.
Widener: All nine.
Spencer: And here I am sailing.
McDonald: Oh, you look so happy.
Spencer: And here I am not sailing, but sitting in a not very good position, in, I think that's in the office of the student newspaper, which some friend of mine was working on. My posture is terrible there. Now, this one is better, if we can get at it.
Mascardo: Something's stuck or something. I have it...I think I have it um...
Spencer: Or maybe you can pull out this whole thing.
Mascardo: I think I have it, um, in a photocopy over here.
McDonald: Is there a chance that we could take this back to MIT and photocopy everything?
Mascardo: I have it all digitized.
McDonald: Oh! Wow.
Mascardo: So I can just...yeah.
McDonald: That would be awesome.
Mascardo: Because that's her original.
McDonald: Yeah, that's what I was thinking, 'I don't know if I could take that since that's awesome.'
Spencer: This is Ruthie Berman. She was a chemistry major. And I knew—liked her better than the other girls. She got through her Bachelor's in three years, and I got through mine in two.
McDonald: Wow.
Spencer: And there I am gazing at a piece of equipment.
Mascardo: Did you get it out, Domina?
Spencer: Yes, I got it out.
Mascardo: Anything I have copies of here, I'm just going to give these guys here to take back. Here's one, right here. She's actually 21, but that's in here, too. So, I think she's actually 21 in that photo.
Spencer: Oh that's was after I was teaching at American University. Oh and you can see what they showed you to use too on the side there...
McDonald: A slide rule.
Spencer: That's a slide rule.
Mascardo: They didn't have calculators then, I guess.
McDonald: I actually have a slide rule. My friend gave me one for my—for graduation.
Spencer: You know how to use a slide rule?
McDonald: I can multiply. I've been able to add on it like twice.
Spencer: And that's a pretty nice picture of me in the sailboat.
McDonald: Oh, Mass Ave.
Mascardo: And here's the one's that you just looked at.
McDonald: Oh, okay.
Mascardo: Sometimes I do it, like, when the undergrads, when she's teaching them the history of math, and they're all sleeping while she's reading and stuff. So, they don't really
kind of know what kind of a life she had. So, at the end of the semester, I hand out like 3 or 4 photos or maybe a packet. And, they're like, "This is you!"

Spencer: Well, I am sitting in our apartment.
McDonald: Cool.
Spencer: And here I am with two of girls that were on the sailing team. We had a lot of fun sailing. And these are other girls who were on the sailing team. And that was the boy I dated in college. He was a very good sailor, but he never managed to get through MIT.

Mascardo: But, he was rich (Laughter).
Spencer: Terri can tell you more about him. She's found out more about what happened to him.
Mascardo: So that's the other file, pictures of her and another girl.
Spencer: But, he was a very good sailor. And what have we here? Here I am in a sailboat again. And, there I am, and then these are more things about sailing. And then I got my Masters' degree.
Mascardo: Sorry, Domina. This is an article about you in Mademoiselle Magazine. So, put that in there for now.
McDonald: Yeah, that'd be good, and then we can put it all together.
Mascardo: Here's a thing about the smoker.
Spencer: That's when I got my Masters' Degree. And this is when I got my first job at American University. And that was the proof that I was a scientist. That's when I was the head of the Physics Department.
Mascardo: I'll put this in here because that's Pennsylvania.
Spencer: And there he is...Doctor Compton and then more sailing...and there is when I got my Doctors' Degree.
McDonald: Cool.
Spencer: You notice three women, two women, six women...at that time. And then here are more things at Marblehead Race Week. One time my mother crewed for me up there, and she was seasick. She kept turning to one side of the boat and vomiting over the side. But she did everything I told her to do, and we won the race, and her upset stomach disappeared completely when we crossed the finish line, and the lineman signaled that we had won.

Widener: Did you compete against other girls or was it a co-ed competition?
Spencer: Well some of these were against boys and girls, and some were just girls. The women's regattas were for women and the, and then sometimes at Marblehead, I competed in races with both of them. And at MIT, I did all the time. What else do we have in here? The luminous ceilings that we developed. They wrote articles about that. And what in my word is this? I don't recognize it. What is it?
Mascardo: It's a program of some sort. Oh, or maybe it's like, um, negatives, probably negatives.
Spencer: Oh, it opens here. I don't know what's in here. Doesn't look like much, does it? I can't tell what it was supposed to be even. The Wait Studio.
Mascardo: This is the book with you in there. I guess they picked so many...
Spencer: Oh that's the book that...
Mascardo: They picked thirty women from the twentieth Century and you were one of them, I guess.
Spencer: You can see my doggie. That’s the copy I gave Struik on his one hundred and sixth birthday, and that’s his daughter.

McDonald: Cute.

Spencer: And you see what I had here was my Hypatia, my chihuahua, and we were in a gondola in Venice.

McDonald: That is a cool picture.

Spencer: I think that's a nice picture. This is the original.

Widener: Oh, wow.

Spencer: It's better in color.

McDonald: Yes.

Spencer: They wrote up a, well, what women mathematicians they could find in those days. And there were not so many of those, so there were not so many written up. But there is the book.

Widener: Wow.

McDonald: That's really cool.

Spencer: And that woman, that's the author of it, was at those meetings we were at just about a year ago.

Mascardo: Yeah, we were at MIT last year. Roberta Murray, I guess her name is. I think she teaches.

Spencer: So, she is still active around places, and what is this?

Mascardo: Looks like one of those papers you were spotlighted in.

Spencer: That's when I was at Brown anyway, something or other. And you know my Bachelors’ Thesis advisor was President of MIT, Stratton, in the 1950s. And it was under him that he suspended my Professor Struik with whom I did my Doctor's Thesis for quite a few years.

McDonald: Why?

Spencer: Why?!

Mascardo: That was during the whole Communist thing, right?

Spencer: He had attended meetings in which he had expressed political views that were a little left of center.

Mascardo: Oh yeah, during the McCarthy Period, that’s right.

Spencer: During the McCarthy Period. It was absolutely horrible.

McDonald: That’s ridiculous.

Spencer: He wasn't allowed to teach in most of the 1950s. I wondered when I came down here if I would get in trouble here because of my thesis advisor's politics, which were nothing outrageous. He believed in helping people!

McDonald: That's not a bad life policy.

Spencer: But, for this, Stratton suspended him and some other people. It was outrageous.

McDonald: Speaking of politics, what was MIT like during World War II? Because you were there before it started and then afterwards. Radar was invented and all that sort of thing.

Spencer: Radar. Everybody was in radar. And I felt that—I did not believe in killing people. And I did not believe in working for any of the military things. By then, I knew Professor Moon pretty well, and I...he was born a Quaker, so he had some background in believing in peaceful ways of treating people and was a vegetarian
before I met him. I talked him out of working on any of the military projects during the Second World War.

McDonald: So you guys worked on lighting instead.
Spencer: We worked on peaceful things. And, the closest I got to the military people was when I went to teach at Tufts. And I had two kinds of classes there: the ones that were in the V12 program and the ones that were civilians. The civilians were afraid of being drafted if they got any low grade. The V12 boys were safe until—safe in school studying to be officers. I didn't like to be teaching V12 boys, but I didn't see any way that I could get out of it. But I figured, or consoled myself, that if I didn't fail any of the students in either group, the civilians that might get drafted or the boys that were already in the Navy but could study to be officers, hopefully until the war was over, which they did. If I didn't fail any of them, I figured I could keep them from getting involved in the war.

Mascardo: I got to tell them this story, that's so funny, that's unrelated. I just thought of it. She's teaching this class. And she hardly ever worked on a white board. She had a regular chalkboard, right? So she's in there writing all these equations on there, on the white board. You probably don't remember this, but it's hilarious. So, she's writing on it, and right, two seconds before class is ready to end, she fills up the entire board, doesn't realize she's used an indelible marker. (Laughter) Then she, you go up there and you try to erase it and it doesn't come off and you go, "Oh well." And she just leaves. And I'm thinking, the guy who comes in here next and starts teaching will be like, "What has someone done?" What did you say? "Oh mercy." or "What have I done?" and left. That was so funny. It's like, three, four whiteboards of equations and then "Uh oh."

Spencer: It sounds possible. I don't think she's making it up.
Mascardo: She's standing there, "It's not coming off. Quick, let's go. Let's go."
Spencer: Well, I tried to behave decently, but I make some mistakes.
McDonald: Behaving decently is for boring people.
Spencer: In any case, I have had the policy of working my students very, very hard...
McDonald: Well, you did go to MIT.
Spencer: ...And not failing them.
McDonald: I like that policy.
Spencer: There was one student who asked me, "How many homework assignments are there going to be?" And I go, "50, if not more." And the other was like, "50?" I was like, "Yep." But I give them lots of chances to learn things.
Mascardo: You actually have a pretty good grading policy.
Spencer: And I don't fail them. If they deserve to be failed, I give them an incomplete, which turns into an F automatically, if they don't make it up. But they have a chance over the summer to make it up.
McDonald: Cool.
Spencer: I had some in my class today that I hadn't seen much.
Mascardo: Is MIT still on a five point scale?
McDonald: Yes. Where an A is a five, a B's a four, etc.
Spencer: What is in here? I do not know.
Mascardo: That's that thing you got an award at...
Spencer: Oh, a hundred years of women at the University of Connecticut. Yes.
McDonald: So when you lived on—so how many people were there, going to MIT, when you 
appeared? Now, there are about 4000 undergrads.

Spencer: I don't remember how many. You can look that up somehow. I think it was 
maybe half that or something.

McDonald: I was just trying to get a feel for how many women there were compared to...

Spencer: Well, we had almost the same buildings. And they keep building more. Now here 
is a picture of—what is this? I'm in it. Let's try to figure out what it is. This is out 
at General Electric. And this is when I was working intensively in lighting design. 
And there I am in the middle of it and all these men around me, out in Cleveland.

McDonald: A rose among thorns.

Spencer: And, that was some kind of conference I attended; only woman at it. It seems to 
me—

McDonald: Did that happen to you a lot?

Spencer: It seems to me to be the normal distribution, to be all men and me. Because of 
that, I've been to so many things where it's been like that. And this is when I 
taught at Brown, I believe. They took lots of pictures of us. This was Professor 
Lindsay, who was the head of the Physics Department when I was there. A 
woronderful man. I enjoyed working in his department immensely. And here is the 
whole Physics Department at Brown, when I was there. And there is Professor 
Lindsay and there am I. And, I think there was another woman somewhere, but 
not many.

McDonald: It looks like there are three more.

Spencer: And this is a different year at Brown. They took these pictures every year. There 
is the Department Chairman, and this time I'm sitting next to him, and all these 
other men round him from Brown. There's a woman back there, and there's 
another one.

McDonald: All three of you.

Spencer: I think she's just a graduate student, not on the faculty. Maybe she had an 
assistantship. I don't know. And this is this dinner they had at the University of 
Connecticut celebrating that they had women. They always treated women much 
better at the University of Connecticut. When I came here, there were four women 
in the Mathematics Department.

McDonald: Now, you, did you apply for a professorship at MIT?

Spencer: I talked to people about this. Professor Struik tried to get me a position there a 
number of times, and they said, "Nope. No women."

McDonald: Interesting.

Spencer: They got women two years ago.

McDonald: Yeah, there are two of them on the faculty now.

Spencer: There are four I had heard.

Widener: Is one of them Bonnie Berger?

McDonald: Yes.

Mascardo: I like her.

McDonald: And then there's...

Spencer: They make progress.

Mascardo: Bonnie Berger's cool.
Spencer: And I'm very lucky that women have had as good an acceptance as I had when I was born. If I had been born earlier, it would have been much worse. And what is this? I think that's when I was at Brown. Is that right? Yes.

McDonald: Cool.
Spencer: What's this? A piece of cardboard. Is there more in here? Anything worth looking at?

McDonald: Did they have—we just—Patricia and I are both sophomores and last night, they had Ring Delivery, where we got our Brass Rats.
Mascardo: You got your Brass Rats. Alright!
McDonald: Last night! Anyway, I'm still very excited about it. Did you guys—I know the Brass Rat thing started in the 1920s.
Mascardo: She didn't get--
Spencer: No, I never had an MIT ring.
McDonald: Were they a big deal? Apparently not as big of a deal.
Spencer: I think it's lovely.
McDonald: Yes, I mean, now each class designs their own.
Mascardo: They do?
McDonald: Yes!
Spencer: Beautiful.

(Two conversations ensue)

(Conversation 1:)
Mascardo: They design their own. So do they still have the, um, beaver on the front?
McDonald: Yeah, they still have the beaver on the front.
Mascardo: So what's different? You can leave it on. You don't have to take it off.
McDonald: It's easier to see if I take it off. I promise.
Mascardo: Okay. So when each class designs their own, what do they do with it?
McDonald: All kinds of stuff. We design all the different sides of the ring. So they keep the beaver and your class and everything, but everything is redesigned. So there's a Boston skyline and there's an MIT skyline. And then the seals on here somewhere always. But the actual design of this, if you bring it up on the computer, everything's on there. Like the Smoots on the bridge and everything. It's really intense.
Mascardo: Oh, that's nice.
McDonald: There's actually a group that takes all summer.
Mascardo: So is this white gold or is it?
McDonald: This is actually Celestrium, stainless steel on steroids. But I have a gold one too.
Mascardo: All the ones I've seen are gold so I...
McDonald: On the inside there's like the hacker's map.
Mascardo: Oh get out! I've got to go get my reading glasses.
McDonald: If you have a computer, it's a lot easier to see.

(Conversation 2:)
Spencer: There are more sailing pictures. Oh, and this is a picture, sitting down on the steps of Mass Avenue. And there I'm sailing again. And there's Parry, playing the cello.
And there he is playing with two other people at MIT. We used to do that every
week. And there he is. I don't know just when that is. And there is, Julia Stad, she
was a Dutch Jewish Christian Scientist. How's that for a combination? She was
one of my best friends at Friends Select. And this is my best friend since I was a
little girl in Oberlin. She's now living in San Diego.

(Conversations recombine)

Spencer: And I think that's her, too. And here's her wedding picture. There she is dressed
up as a bride and there is her husband. They live in San Diego. That's their
wedding. I didn't go to it. That's while I was at Tufts and I was busy teaching.
She has been my best friend since I was eight years old.

Mascardo: Were you and your husband married in 1961? And you have one son?
Spencer: One son.

McDonald: Cool, but you knew each other since the '30s.
Spencer: And he's a research scientist at MIT. And he tells me he wants to get married
sometime, tells me he wants to have children, but I think he needs to find a girl to
make that work.

McDonald: That's probably important.
Spencer: Yes. And here's my mother and my sister and me. Mother with her mouth wide
open.

McDonald: Probably saying something.
Spencer: And where did these come from? Some place in here. Yes, this place, this pack.
And what have we here. This is Professor Harrison who was head of my
department when I was at Tufts. I got him the best job he ever had at Brown. He
was at Brown the last year I was there. And that is Professor Lindsay the head of
the department there. And there am I. And you don't see many women in the
department. That was the Physics Department. And there am I, and that is
Lindsay, and that must be the year before.

Widener: That looks like MIT. It must not be.
Spencer: That's not MIT. That's Brown. These are all the people in the department at
Brown. The buildings look somewhat alike. We must be at a different door than
this one.

Widener: Yeah.
McDonald: Yeah, very cool. So what was the social life like when you were at MIT? Right
now they tell us you can do three things: you can either sleep, study, or have
friends. You get to pick two out of those three.

Mascardo: Sleep, study, or have friends. She studied and studied and studied.
Spencer: Well, I went sailing and I studied. And I went sailing and I studied. And I had this
boy friend, Tommy Gouzoule. He was Greek and lived in Roxbury and had two
sisters. I think he was the only one that got to go to college. Is that right?

Mascardo: I guess so. No, well, one of his sisters became a nurse.
Spencer: One of the sisters ended up as secretary to a senator in Washington. I ran into her
in an office down there, in Washington one time. Well, my sister was there. But
because she was a woman, it was very difficult to get a position except in teaching
in a women's college. She got her doctor's degree, it was '36.
Mascardo: PhD in 36?
Spencer: Yes, I think. Yes.
Mascardo: No ...I thought she got it in the '20s.
Spencer: She got her degree (her PhD) my junior year at Friends Select and I graduated in '37.
Mascardo: Okay, '36. You're right.
Spencer: She got her doctor's degree in '36. And it was—if you had been raised in Oberlin to think that it was almost sinful to teach at a women's college because women should not be educated separately from men, why, it was next to impossible for a woman to get a position. My sister wanted to teach in a co-educational college. Instead, she found she could earn twice the salary at a college in Washington, and she was there in Washington. Had a beautiful house in Washington, in northwest Washington, right on the edge of Maryland. Across the street it was Maryland. We had a house on a triangular lot about 50 trees on it, so dense that you could hardly tell the house was there. It was like being in the woods.

McDonald: Cool.
Spencer: And yet, we were in Washington.
Mascardo: Tell them what you did so you didn't have to mow the lawn.
Spencer: Hmm?
Mascardo: Tell them what you did so you didn't have to mow the lawn.
Spencer: Well, we just planted...let the grass grow.
Mascardo: No, you planted ivy all over the place.
Spencer: And planted ivy. But the ivy was there when we got there, and we encouraged it, so.
Mascardo: It was all over the yard. You were like, "Wow."
Spencer: And you could...There was ivy everywhere in most parts of it, and then we had an area where we ate outdoors on the one side. And you looked all around you and all you could see was woods.

McDonald: Cool.
Spencer: And yet, we were right in the city.
McDonald: Awesome.
Spencer: So that was nice. But Vivian would much rather have had a position teaching. And I would have much rather had a position teaching at MIT, instead of wasting all this time commuting.

McDonald: It was a long commute.
Spencer: Professor Struik, my thesis advisor, tried to get me a position there a number of times. Couldn't make any headway. Of course his left of center political activities...
McDonald: Probably didn't help.
Spencer: ...Which were not at all unreasonable as far as I could see. I worried when I got my position down here in the 1950s; feared that I might lose my job because I was his student. I didn't.

McDonald: That's crazy.
Spencer: It's not crazy. It's the kind of thing that happened then, in the McCarthy period.
McDonald: Yes.
Spencer: People were accusing people of having, doing terrible things. And Struik was suspended for most of the 1950s, most of the first ten years I was down here. And
then they let him go back to teaching for a few years and forced him to retire at the age of 65, I think. He lived to be 106.

Mascardo: So he was actually retired longer then he worked
Spencer: Yes.
Mascardo: So they didn't make any money off of him.
Spencer: He had a beautiful house out in Belmont and he kept on writing books. He was very active. But he should have been teaching! He was the best mathematics teacher that I ever had anywhere.

McDonald: It's a shame they made him retire.
Spencer: And...
Mascardo: What do you guys do at MIT?
Spencer: What do you want to do?
Mascardo: Sleep, have friends, or study?
Spencer: What do you want to do after you finish your work at MIT?
Mascardo: She wants to teach high school, she said.
Widener: I want to teach high school.
Spencer: You do? That's the hardest teaching, I think. And perhaps the most important.
Mascardo: Do you want to go back to Orange County or..?
Widener: I don't really live in California anymore.
Spencer: And what do you want to do?
McDonald: I want to do something international humanitarian with my engineering degree.
Spencer: Well that's marvelous.
McDonald: I don't know how that's exactly going to work out yet, but that's what I want to do. They actually have this amazing lady, Amy Smith. She's a professor there. She did her undergraduate and Masters' at MIT. And she actually has these classes called D-lab. I took—They have Development Lab, Dissemination Lab, they're all focused on World poverty and how you can apply engineering to solving world poverty issues. So I took that class. I mean, it took up so much time. It took up 24 hours a week, literally. I actually counted it, and it was between 20 and 24 hours a week.

Spencer: That sounds wonderful.
McDonald: But it was awesome. We were partnered up with a village somewhere in the middle of nowhere. Mine was in the northwestern China. And they presented us with a problem, like "How do you heat their house without having them burn things?" And so it was just crazy, oh and they don't have any money. So my friends and I worked on some different solutions for that, and some of the people in my group actually got to go there. I didn't get to. But some of the people in my group got to go there in January and actually see if the stuff that we designed worked and what we could do to make it better and things like that.

Spencer: That’s marvelous.
McDonald: So, yes, it's really cool.
Spencer: My sister's best friend was a girl named Ying Tak Chan whose father was a very important politician in China. And so, we have always felt particularly close to the Chinese.

Mascardo: Yes, I think that's what that scroll came from right there.
Widener: Oh, okay.
Cool,

Yes she got out—

Ying, she tried to go back to China and was there for some years after she got her Doctors’ degree. I think she went to the Medical School in Chicago after she graduated from Oberlin. And she thought she should serve her people, but things were so bad under the Communists over there that when her relatives were in the same town as she was, she wasn't even allowed to go to see them. They told her what she could do and what she couldn't do.

That's awful.

And so she came back to Washington and got a position in one of the federal hospitals. She was a doctor. And we got to see a lot of her again, for several years, when she was probably about 60. Then unfortunately she died, relatively, relatively soon. But when Euclid was a little boy we have pictures of him with Ying, when he was this tall.

Listen to Nikki snore. So you guys have to write up something. Is that the idea?

Well, what will actually happen with this is, we have, we actually have some forms that you have to sign to say it's okay that we interviewed you and that sort of thing. And then we'll take this back. We'll transcribe it on a computer, and then we'll send it back to you, so that you can look at it and if there's something that you talked about that you say, "Oh, I don't actually want that in the archives."

Are you recording all of this?

Yes, that's what this is doing.

Actually, I have such an amazing memory that I'll type it all up later. (Laughter)

So, is there anything else you'd like to ask me about?

I've had lots of fun all my life. I love teaching.

You've been teaching for over 50 years. So, what changed from when you were an undergraduate to when you began teaching to now? Like how's the classroom...

My salary.

Well, as long as it's a good thing.

I was just going to ask, what are the students like? Have the students changed?

Like, how have the students changed? Has the way that you present things changed?

What's different and what's the same? How about that?

One of the nice things about teaching, I think, is getting to know students from every nationality. To have, for example, I have had five students that did PhDs with me. The first one was born in Framingham. His father was a doctor, and he was an ordinary American. The next one was born in India. And my best student of all was Uma who came here from India with nothing, no name, except U-M-A.

So it's more integrated now right?

They didn't use last names in India.

So it's more integrated, right?

And she came over here in January in 1950, with nothing but barefoot sandals.

Not 1950!
Spencer: Wait a minute—not 1950! 1980!
McDonald: 1980.
Spencer: 1980. That's when she came. I had forgotten the--
Mascardo: You came in 1950.
Spencer: 1980. And she's perfectly wonderful and she'd head of the Mathematics Department at Bridgewater State College now, and still working with me frequently. And she's done very well. She didn't know what to say. They said, "But you have to have a last name!" So, she used her father's one name, which was Shama. And they called her here: Uma Shama.
McDonald: Interesting.
Spencer: She has been marvelous. And then I had this boy named Phillip Mann, who is very, very bright and absolutely obstinate.
Mascardo: You have to talk about Philip, yeah. Philip has six degrees. He got four bachelors in four years, a Masters' and a PhD afterward and he still does not work. He's figured out a way to get money somehow, some way, lives in this commercial building. He is so smart and yet so way out on the fringe.
Spencer: So smart and so obstinate, I'm still doing research with him. And he has proved in his doctors thesis that Maxwell's' Equations are incorrect.
McDonald: Oh, really?
Spencer: And that is very good. We're giving another paper on that at the NPA meetings in May.
Widener: There goes freshman physics (Laughter).
Mascardo: Yes.
McDonald: I've spent a lot of time learning those equations.
Spencer: Well, you have to learn not to believe everything you're taught in physics.
Mascardo: You know what Patrick Kumavor said about—we were talking about biology. You know, talking about Life Sciences and how you have to memorize so much. And he says, "What do you think Domina would say?" I go, "I don't know. What do you think?" "Not a single postulate in Biology." That's exactly what you would say, wouldn't you?
Spencer: Yes, I'm always talking about postulates because that's what you base mathematics on and physics on.
McDonald: Yeah.
Spencer: And if those postulates are incorrect...I love Maxwell's Equations, but unfortunately they aren't quite right.
Mascardo: Domina, I don't think that I've shown you this, I just wanted to show you quickly, Patrick's dissertation. This is the guy that brought her down, the West African guy. He gave me a copy of his dissertation, and I never read the inscription, right? And so he says, "To Terri, entangled with me in an infinite Hilbert space." (Laughter) "To Terri, entangled with me in an infinite Hilbert space." I thought that was....
Spencer: That's nice.
Mascardo: So what's the same about students? Now they're more integrated. What's the same about them?
Spencer: Well, it used to be unusual to have a woman in your classes that wanted to learn mathematics. And now, it's about 50/50.
McDonald: That's pretty good.
Spencer: And that's good. That's very good. And I like having foreign students. And, and, I think teaching is a great deal of fun. Every time I teach, even in courses that I've taught many times, I learn more.
McDonald: So what courses do you teach now?
Spencer: Well, I'm teaching lately, primarily the History of Mathematics.
McDonald: Cool.
Spencer: And that is rather fun, as far as you can—it is important for people in—mathematics majors. Most of my students are mathematics majors. To know where calculus came from and where vector analysis came from and to learn what the postulates are in the various branches of mathematics and to realize that not everything necessarily falls into the ordinary Euclidean space but they have to be in spaces that are more complicated. And what I'm always trying to do in our work on Holors is to find the mathematics that fits the application, rather than trying to force the applications into a particular kind of mathematics.
Mascardo: You have to reverse engineer it. Are you guys done taking all your formal math now?
McDonald: Yes, so I took calculus, multivariable calculus, and differential equations. I still want to take linear algebra, but so far it hasn't fit into my schedule.
Mascardo: Oh, you know who's a good teacher for that? Gil Strang. Yeah, Gilbert Strang. He's at MIT. He's really good. Well, you can probably see him on Open Course Ware. But, yeah, he's written a number of books and he's pretty good. And you're done too.
Widener: Yes, I just took calculus and then multivariable calculus.
Mascardo: Yes, whatever you needed.
Widener: Yeah, chemistry!
Spencer: That's about what you need.
Mascardo: There's this guy that's on the faculty at the physics department. He's retired now that went to MIT when he was about 17 and he's like 78 or 80 now. And he tells the funniest stories. And I do this imitation of him because I can't talk about him any other way, except to imitate him. It's kind of like a Saturday Night Live skit almost, you know? So he says when he's—this is Bob Schor—he said when he was at MIT, right? He said, "You know," he says. "You know, I got there." What he did was, he applied to RPI first. He said, "I thought I was going to get in 'cause I won the math medal there." He goes, "Lo and behold, I'm not in." So he goes, "I didn't know what to do." He goes, "The only other place I applied to was MIT, right?" So his brother lives with some kind of super duper medical doctor, finished college when he was 19. So Bob's shaking like a leaf, wondering where he's going to go. So, MIT accepts him, right? He goes, "Oh, no." He says he gets into all these basic, weed out courses, "You know what I learned from that? Right?" And I go, "What?" And he says, "Well, most things can be done with just simple sines and cosines. You don't need all this other fancy shmancy stuff. That's for like the really smart crazy person who wants to bang their head against the wall." He goes, "But if you really want to solve the problem, most things can be done with simple sines and cosines. You know? The most simple functions!" And stuff like that. And you know how Bob is. So he's funny in some ways but he's serious in other
ways. You know? And you know, he's just like, he's a long range thinker, but he
doesn't realize how funny he is when he's telling a story. Sometimes, and he goes,
"I'm there. And they didn't care about me." And he goes, "What do they care if
they flunk Bob Schor out?" And he said, "I was a loner. I didn't do anything
smart, like study with people." He goes, "I was off by myself. You know,
sweating bullets." And this and that. You know? And it was so funny. And so
you know, he finally went out for his Ph.D. at Michigan... So, I said, "Bob, when
you finally finished at Michigan. What did you decide to do?" And he says,
"Well, now I'm smart. I've gone to MIT. I've gone and got my Doctors' degree." He
goes, "Somebody, a secretary, taught me the simplest thing at Michigan U.,
you know, the smartest thing." He says—"she was supposed to do something on
this computer when it was all batch systems and all that; and he was doing his
thesis and he kept coming back going, do you have this done yet? And she's said,
'Nope.' "And two weeks later, I'd come back and go, 'Do you have this done yet?'
And she'd go, 'Nope.'" He goes, "Do you have this done yet? Is there a problem
here?" And she turns to him and she says, "Look. You're going to get your Ph.D.
out of this. What am I going to get out of this?" And so Bob's like, "Now that's
clever." He says, "So when I went out into the working world, after I got my
Ph.D. - Right? He says, "I had three offers. I could have a post doc at MIT." He
goes, "I could have an assistant professorship at Dartmouth." He goes, "Or I could
take the instructorship at a branch over at U. of Connecticut." So he says, "Well, I
didn't want the one at MIT because I knew what they were working on there and I
was tired of taking instructions. And I knew that's what it was going to be if I went
back to MIT." So, he goes, "I didn't go to Dartmouth 'cause I knew I wasn't going
to fit in there." And I think that was because of the quotas, because Bob is Jewish.
There must have been a quota. Just like Dick Feynman went to Columbia but they
didn't accept him because of the quotas, so he went to MIT. So he says, "I wasn't
going to fit in there." So he says, "I took the instructorship at Connecticut." And
he goes, "It was the best decision I've ever made." It was so funny when Bob said
it. You know, he's a long range thinker and you don't think that he's, you know,
like watching things, but he is. It was so funny. And then like all the time that you
try to reform Philip, this guy that we're talking about, the real strange one—well,
Bob has had him in several classes, and Philip never puts his name on any paper.
For whatever reason, he doesn't put his name on the paper. So, he drove the paper
grader crazy. And Bob says—Bob knew he was bright right away, so he tells the
TA, "I'll, take care of that one myself." So then, when we go to colloquium,
Philip, what's he doing? Begging money from people and all this other weird stuff.
And then you're trying to lecture him on this and then Bob comes up with his plate
of crackers and he goes, "Domina, Philip has already calculated way back when he
was five, that this is not to his advantage." Which is true! Philip, he's another long
range thinker, and he's always trying to arrest somebody or make the law
something that it's not. And Bob said that one day he begged a ride from him to
the police station so that he could report something. And he goes, "There was a
red light. So, I'm stopped at the red light, and Phil goes, 'Why aren't you going?'"
"Red light," he goes. "Well no one's around." So I was just like, here you are.
You and Bob have gone to MIT, but have somehow turned out totally different in
your analysis of things. It thought that was pretty good when he was saying all
that stuff.

McDonald: Alright, so I have some other questions that I've been thinking about. So, what
dorms and things like that...what was the student housing for the guys then? That
was available?

Spencer: Well, some of the larger ones hadn't been built then. And they had the smaller
ones that had been built. Those were sort of behind the President's house.

McDonald: Oh, Senior House and East Campus.
Spencer: And then, there were people that lived at home or were residents in greater Boston.

Mascaro: Well, your girl friends lived out in the 'burbs, right? And then they took the
subway in, right?

Spencer: There was nothing to speak of for girls when I was there. They let us in. They
treated us decently. But they weren't prepared for girls.

Mascaro: How many all girl dorms are there now?

McDonald: There's one all girl dorm, and the rest is all co-ed housing.
Spencer: Now, my thesis advisor, Professor Struik, was very much in favor of women. His
wife was the first woman to get a doctorate in mathematics in Czechoslovakia, or
at least at the University of Prague in Czechoslovakia. And then he married her,
and she never could get to do anything that was related to mathematics in Boston.
The closest she could get was to do some work in the stacks at Widener
Laboratory--Widener Library at Harvard. She was always, all her life—and I
knew her 'til she died, when she was quite old—and, she was always mourning
that she wasn't allowed to do anything with her mathematics. And what did they
have? Three daughters. And one of them got a PhD in mathematics and got to
teach at the University of Colorado for years. And the second one married a
Catholic and had—I've forgotten—five or six children, as many as possible.
(Laughter) And she lived near Professor Struik; I mean, a ten minute drive from
where he lived, so he could come over and see her everyday if he wanted to, with
great ease. She's been wonderful to take care of him, and has specialized in raising
her children. And the youngest one got into a different field and got a Doctor's
degree but not in mathematics and is living in New Zealand now.

McDonald: Cool.
Spencer: But he has been always—Stroik and his wife—have always been terribly interested
in helping women to do something worthwhile in mathematics. I was very lucky
to work with him. And he gave the most beautiful lectures, and was a wonderful,
wonderful teacher. One of my three best. Of course, Professor Moon also gave
magnificent lectures.

McDonald: Apparently.
Spencer: Very beautiful.

McDonald: Cool.
Spencer: And we have had a wonderful time doing research together.

McDonald: Now, you guys did research together for 20, about 20 years before you got
married.

Spencer: Yes, he had been married before, and had lived with his wife. She taught French
in New York City. He met her in Bermuda when he was there on a short trip and
she was there on a short trip. And that's how they met. I think they had one day in
Bermuda that was in common. They were on trip that barely met. And then he went to see her a few times, and they got married very quickly. And, uh, she taught French, didn't want to live in Boston, thought he should give up his job at MIT. What's MIT? Nothing, compared to teaching high school French in New York City.

McDonald: Oh, of course.
Spencer: Well, that was what she thought. And she was not going to move up here, and she did come up here for a few months when they had a baby, one son.

McDonald: Oh, how nice.
Spencer: And then she went back to New York, and he went down to see her maybe once in a year. And for a few days, maybe twice, something like that. And that's the way it was when I met him. And well, we fell in love the last year I was in school, which was the first year I was in his classes. And, but, I read the Bible too, and all the way, at that time. I couldn't find any place in there that said you could remarry if you had a divorce.

McDonald: Yes.
Spencer: If you were in a miserable situation and wanted to get out of it, yes, you could. But I could not find any place in the New Testament that said it was proper to remarry. Well, if that's so, I decided, let her have what she wanted, which was Parry's money, and let me have what I thought was the most precious, doing research with Parry. And that's what we did in all the period I was at Brown and Tufts and then at the University of Connecticut until after she died. And suddenly she died in about '47, I think it is. I'm not sure of the date, but she just suddenly died. Not sick a long time. Heart attack. Gone. And, we didn't think we should get married right after. And so we waited—what was it?—four or five years, something like that. And then in '61, we did get married. And then we didn't think we should have a baby instantaneously. And when was Euclid born, '65?

Mascardo: '65.
Spencer: See she knows more about me than I do.
Mascardo: Because my parents are married the same year, have a son born on the same day.
McDonald: On the same day?
Mascardo: On the same day! Yeah, isn't that weird? And my grandparents are 22 years apart, like you and Parry also. And we also have, you were married the same day as my parents too. Same year. Same day. You guys were doing an awful lot the same. Yeah, I know.

Spencer: And we had wonderful years until Parry died in, when was that?
Mascardo: '88.
Spencer: '90--
Spencer: '88. And that's about when I met Terri.
Mascardo: No, '84. Oh, no. You're a mathematics professor. Oh, I'm sorry. That's arithmetic (Laughter).

McDonald: Yeah, yeah, yeah. You know math majors can't do simple math.
Spencer: And in any case, I think we had the most wonderful marriage since the world began. And we did our eight books together that were published and now we have the ninth one that Terri and I worked very hard on last summer and sent in

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October. And now we're working on a tenth one and that will be a sequel to our holor book that Cambridge University Press published. You know what a holor is? We made up the term.

Widener: No idea!
Spencer: It comes from the Greek word for a whole.
McDonald: Ok.
Spencer: It's an entity that's described in terms of many parts. It can be a scalar; that's the simplest holor we have: one number, temperature at a point. You just need one number to represent that.
Mascardo: Remember you had that big argument with Bob Schor of the notation—I think it was the arcsine or the arctangent. And he said, "Sine to the minus one." And you got so mad, you argued for like an hour on that.
Spencer: Well, I don't think that's a very good notation, but...
Mascardo: But everybody accepts it.
Spencer: It has been used widely, but it's sort of confusing.
McDonald: Yes, it is.
Spencer: And then there are vectors, and you know something about vector from the mathematics you've taken. And you can describe most of classical physics in terms of scalars and vectors. That's what the book we just finished is about, the part of physics that you can describe in this way, and you can do everything from heat flow to hydrodynamics to...
Mascardo: It's all those equations right there on that window...

Spencer: Mechanics to electromagnetic theory
Mascardo: Which are all in indelible ink, too.
Spencer: To Maxwell's equations. You can do all of this in terms of vectors very nicely. That's what the book that we have just finished is about. It is intended for an advanced undergraduate physics course that we teach and that Uma teaches at her college. And Uma is a co-author on that, too. And that's good, but you can't describe everything in terms of scalars and vectors, can you? So, the next book that we are working on now will be about 10 chapters and will have all kinds of applications in it of holor algebra. What kind of things—there are things that you want to talk about that are not just scalars or vectors and you want to have the mathematics that fits them as well as possible. Some of the things that are interesting are nutrition. We all eat. And if you can represent the food that you eat mathematically, you can learn to think better about optimizing your diet.

McDonald: Yes, that makes sense.
Spencer: If you can't analyze a thing mathematically, you're just guessing. You can say, "Yes, I like celery. Yes, I like cheese. Yes, I like this." But how much? What is the optimum diet? What is the diet that will help you to be healthier and to live the longest?

McDonald: Interesting.
Spencer: There are lots of statistics on this. And one of the papers that Terri collaborated with me on was the Mathematical Representation of Nutrition. We're going to have a chapter on that in this book that we're working on now that I think is going to be called, 'The World of Holor Algebra,' mentioning that there are all kinds of
different kinds of algebras. You—there are some things that are much more complicated than others. If you're going to talk about classical physics, you can do it all with scalars and vectors, but does classical physics cover everything? No, it doesn’t.

Mascardo: That's two math classes that I don't think I would do well in: analysis, and maybe topology, too. And abstract algebra. The things that have no direct application to me, you know. It's so hard for me to get my mind around it, you know.

Spencer: I like things that have applications.

Mascardo: I just don't do very well at just following a bunch of rules.

Spencer: And so what we are doing in this next book, called *The World of Holor Algebra*, is to put in various applications. For example, Dr. Kumarvar—is that, have I got his name right?

Mascardo: Patrick?

Spencer: Patrick, yes. That came in with me; that just got his Doctors' degree at Connecticut last year. He, um, does work on the study of very strange things.

Mascardo: Entanglement.

Spencer: You have some materials that you send light incident on them, and it breaks into two parts. How do you specify that in terms of scalars and vectors? You can't! So he had to introduce a new algebra for that. New algebra for nutrition. What other applications do we have in that book anyway?

Mascardo: For which? The holor book?

Spencer: Then we have the application to the mathematical representation of the Trinity.

McDonald: Of the Trinity?

Widener: Oh, wow that's so cool.

McDonald: The mathematical representation of God?!

Spencer: We're having a paper on that and we're presenting it at the NPA meetings. This is one of my friends who was at MIT. Went to the fraternity, joined a fraternity on Memorial Drive. And he knew me when I was in college, but I didn't know him. I lived at 410 Memorial Drive and his fraternity house was here where I had to pass it any time I went to any of my--

McDonald: Which fraternity was he in? Do you remember?

Spencer: Hmm?

Mascardo: Which fraternity was Chris in? Do you know?

Spencer: I don't remember. It's on the corner, just before you come to 410 Memorial Drive, I think it is.

McDonald: Because right there, there is Delta Epsilon, Kappa Sigma, TDC—what's that?—Theta Delta Chi.

Spencer: I don't remember the name of the fraternity, but I remember that there was a street here. And a nice looking fraternity house and then there were two or three more buildings and then 410 Memorial Drive. And, so he knew me and I didn't know him, and about 20 years later I was at—18 years later—I was at, uh, on a committee of the illuminating engineering society in New York and I got to know very well a man who was on that committee and worked at Sylvania up in Salem. I got to know him 'cause he and I were the only two member of that committee of about a dozen people that didn’t smoke. And because he didn't smoke, I sat next to him. He smelled better.
McDonald: So true.
Spencer: And because I sat next to him, I got to know him pretty well after a few years. And when they had a problem at Sylvania, he asked me if I'd do some consulting work there. And I did that for 17 years. That was a long time. We got all kinds of interesting problems, but his basic problem he wanted me to work on was: what was the best way of lighting a roadway in fog so that the driver could see as well as possible? And what we learned was that the best thing that you could do was to illuminate as little fog as possible. To put the luminars as close to the ground as possible, and then shield them so that they didn't send light up into the fog at all.

Mascardo: Is that the one that you designed on the Fenway?
Spencer: Hmm?
Mascardo: Is that the lights on the Fenway?
Spencer: That's the light that we tested there. And you know what's wrong with that?
McDonald: What?
Spencer: The vandals (Laughter).
McDonald: Makes sense.
Spencer: Right where we hit the river, when you drive perpendicular to it from my side of Boston, they had a demonstration of this. That's a fairly decent neighborhood. Beacon Street, right beside it. You don't think of Beacon Street as full of vandals.
McDonald: It's all the fraternities.
Spencer: And so, they put this lighting up there that I had designed and in no time it was vandalized.

McDonald: Strange.
Spencer: That was, that lighting has been turned in to the aperture lamp, which is the best light to illuminate, say if you're playing music and you want to light the music up here, and you don't want it in your eyes. Just, we had designed a special lamp called the aperture lamp that has been in use for a long time. Lots of nice things I did. I did lighting there for 17 years. Well, this, this kid that I worked with somehow had lost all his religion after he joined the fraternity. And in going along having lost his religion, until compelled very recently, and somehow he has gotten back his religion by thinking of the Holor Trinity, and so we're giving a paper on it at the NPA meetings on the last Friday in May on the Holor Trinity. What do you—how do we know about God? Creator.

McDonald: Mhmm.
Spencer: Jesus.
McDonald: True.
Spencer: And the Holy Spirit.
McDonald: Right.

Spencer: Chris says those are three sources and that religion is like a vector. It's not a vector in Euclidean space. You can't take the square root of the sum of the squares of the magnitude and add them together and get something that is significant. It's a different kind of vector. But it's a set of three sources of information. And he, by figuring this out-- and he's written a lot of historical things that were put, some of them, in the paper, which is in my briefcase, which is in the car, we could have it, all the notes on this. And it is an idea in which mathematics has helped him, who
couldn't visualize the Trinity as being meaningful before—oh! He's got his
religion back.
Widener: Yes, actually, I wanted to ask you about your faith and how that works out in your
life? Have you ever had any problems with it teaching or something?
Spencer: Well, I've been a Christian all my life.
McDonald: We read in an interview. They did an interview that we found online, that you
thanked God for bringing you to UConn. We thought that was really cool because
we're both Christians...
Widener: Yes.
McDonald: ...And Patricia is extreme—I mean, I'm really involved and Patricia's involved with
the Veritas Forum.
Mascardo: The what?
McDonald: It's this thing...you can talk about it 'cause you're in charge of it.
Widener: So there's a national organization called the Veritas Forum which puts on Forums
on different college campuses to kind of explore Christianity and faith. At MIT,
it's very related to faith and science and faith and technology. It's really cool
because it engages the whole campus in discussions about it.
Spencer: That's sounds good.
McDonald: It's really cool. It's really well attended, too.
Spencer: Sounds wonderful. I wish my son would go to something like that.
McDonald: Well, it's really cool because it's like...
Mascardo: Is it in the chapel or what?
McDonald: No, no, they do it in a big lecture hall; in Kresge and different places.
Mascardo: How long has it been in existence?
Widener: So the Vertias Forum nationally was started at Harvard, but it's only been at MIT
for three years. So this year we had three different events and we had over a
thousand people come, over the course of the three events.
Spencer: Wonderful.
McDonald: Over the course of the three events, they had them exploring Christianity from
different angles. And it's like Christianity assuming that nobody—not assuming
that people are Christians. Just like, "I'm a Christian and I'm a scientist. How does
Christianity influence my research? Does it? Is it okay to be a Christian and a
scientist?" Because some people are like, "You can't have faith in God..."
Spencer: Of course it is!
McDonald: That's what I said. Of course it is.
Mascardo: Even Einstein said that.
McDonald: But, you know, there are people that say, "You can't believe in God and also
believe in science because they're polar opposites."
Spencer: I know there are people that have difficulty.
McDonald: And then they had one guy come in—they had a Christian and an atheist discuss
ethics. And how God, and how their view or non-view of God influences ethics
and the ethical dilemmas that result from not having God.
Mascardo: I always find that interesting 'cause, I think one of the things that she and I have in
common is—you know how people are always saying that they have to define
themselves or they don't know something about themselves? From the time I was
born, that's something, I've always have known and it's just been so completely
obvious to me but I like exploring it, but it's just I don't know, it's just such a part of my identity that I don't get when people...I mean, I'm tolerant but it's just like, that's why I just don't get it. You know what I mean? It's like some people just have this big question mark on their forehead or this big spider web on their face, and I'm just like, you know, I've never been that way. And I think that's the way you are, too. You know.

Spencer: Yes, I, well, I was—I told you, I was converted when I was two hours old. I mean we were Presbyterians in New Castle. There weren't Presbyterians in Oberlin, so I went to the Congregational church in Oberlin. Then, when we went to Philadelphia and I went to Friends Select, there was a Presbyterian Church just two blocks away and that was the one I attended in Philadelphia. There aren't many Presbyterians up in New England, so I don't go to a Presbyterian church at the present time, but to an Episcopal Church.

Mascardo: Are you guys in any particular denomination?
Spencer: And I have always believed in the Bible. And believed that that was your starting point. And that our whole life is dedicated to trying to do unto others as you would that they should do unto you.

Mascardo: Well this thing they're doing sounds like a really good thing.
Spencer: And when I say, "Do unto others," I interpret that as everyone who can receive your love: people and animals. So, I don't eat them. I wouldn't like to be eaten. I have had pet fish so much that I have found that fish have, if you really get to know them, personalities.

McDonald: Yes, we have a fish.
Mascardo: Oh, you do?
McDonald: Or, we've had multiple fish.
Mascardo: In your dorm?
McDonald: We had two now, we've had one before. Yeah, we had a goldfish named Margie.
Widener: Well, we're roommates, so...
Mascardo: Oh, cool!
Spencer: And if you observe them and get to know them, they're perfectly wonderful creatures.

McDonald: Yes, we had one goldfish that lived with us for almost a year. At the end there, she got fin rot really badly, so we were giving her little salt bathes, where you put her in salt water and let her swim around for about 15 minutes.

Spencer: We had 50 fish over when my sister had her house in Washington. We had built a big pool for them in our conservatory, with a waterfall coming down at one end. It was very nice. And we had one fish that acted like the mother for all these other fish. She had the most individuality. We named them after all the Minor Prophets, lots of names there.

McDonald: And a lot of interesting names, too.
Spencer: And I think that I have been determined to not work for any organization that was military. The closest I got to this was teaching the students at Tufts that were in the V12 Program. And I figured if I never flunked any of them, I could keep them from killing anybody anyway.

Mascardo: Yes, I was going to say, that's the way you show your faith the most, is in the classroom.
Spencer: And I did.
Mascardo: You don't fail anybody and you always say to students, "Now, your mother can only have one birthday." And then you had a student once who said he couldn't come to class because he had to go with his girlfriend to get an abortion or something like that, and you told him what you thought about that.

McDonald: Good.
Spencer: Yes, yes. You experience all kinds of things in school.
Mascardo: But she never loses her temper, she just gives them a lecture on Christianity.
Spencer: That was not a good experience. But, I'm trying to be a Christian in everything that I can do. And I don't believe in fighting. I don't—I think the present President [Barrack Obama] we have is somewhat better than the previous one [George W Bush], but he's not perfect. And I hope he gets our troops out of the Middle East as soon as possible. I don't know whether he will, but he seems to be much smarter than the previous President.

McDonald: He talks a lot better.
Spencer: He talks pretty well. He is an intelligent person. And it's to his credit that he's so far had only one wife and had her for 20 years.

McDonald: His kids are so cute. The little Obama girls are so cute.
Spencer: And the children are delightful. And I hope he is as good as he might be. I also thought that Hillary Clinton was a pretty good person. And do still. Actually, I voted for her in the Primaries over him. Then I voted for him in the election.

Mascardo: You can tell them about how you don't even take a wine communion.
Spencer: I have been interested in politics all my life because my father ran for—as I told you I think—ran for Pennsylvania Senator on the Socialist ticket, shortly before I was born and that was when he lost his store. And I think politics are interesting. And I think a woman should someday be president. And I thought Hillary would be a good candidate, maybe she'll be president next time, but we will see.

Mascardo: MIT has a women president now.
McDonald: Yes, Susan Hockfield. She's really cool. I like her a lot.
Spencer: Yes, I've met her several times. And she seems to be very nice.

Widener: She's also a Christian.
Spencer: That's wonderful.
Mascardo: Oh, really?
McDonald: Yes, she is.
Spencer: I didn't get to talking religion with her when I met her, but…
Mascardo: Domina, remember what Susan Hockfield said when we went to the women's thing. She said, her little girl, when she was like six years old was in the back seat, and Susan was talking to her friend about some other, some other president of a university or a dean or something like that. And the little girl said, "You mean a man can be a dean or a president?"

McDonald: Awesome!
Mascardo: Yes, isn't that funny? Yeah, I'll find the picture of you and Susan.

Spencer: Well, I'm very happy that I went to MIT, very happy that I met Parry, and very happy that I still have work to do. I have at least six more books I want to write.

McDonald: Oh, only six?
Spencer: Well, six that I’ve figured out so far. I want to do this one and one on algebra applications ranging from Holor Trinity, to nutrition, to ordinary vector analysis—of course, obviously. And then I want to write a book on the two areas that we’ve been doing much of our research in, in the last 20 or 30 years. You know that in 1935, Einstein introduced the special theory of relativity? And you probably know, or maybe you don’t know, one of the good things he did in that was to state clearly his postulates.

McDonald: Okay.

Spencer: He said it was based on assuming that the velocity of light is always a constant and that Maxwell's Equations are always correct.

McDonald: Oh, and Maxwell’s equations aren’t always correct.

Spencer: And neither one of his postulates is correct. And we have written many papers on this so far. And I think we should summarize in a book the things that mechanics been using on the claim—the Einstein postulate on the velocity of light. And the universal time postulate, which is the one we had introduced which says instead that the velocity of light is always a constant relative to the source. If the light is moving outward from the center, but the point, the center is in motion, then it is a velocity relative to the source that should be used, not a constant.

McDonald: Interesting.

Spencer: And most things that you can consider can get away with Einstein’s postulate. And then there are some that you can't get away with and we want to write up—we’ve mostly written it in papers already. We want to write up a book that would clarify this. And that's the next book after the one we are working on now. And then the one after that should be on the other part of Einstein’s postulates that says that the Maxwell Equations are correct. And I love the Maxwell Equations. I did my Bachelors’ thesis on these equations, reflecting the light from the clouds. But, if they don't always work, then they’re not a theory you can have faith in, are they? A scientific theory should not be theories that work on Mondays, Wednesdays, and Fridays, and don’t work on Tuesdays and Thursdays. And if you have only one difficulty, that's enough isn't it? And in the thesis that my student, the unusual one, Philip, my um...if that thesis is—and we’re doing another paper for the NPA. I’ll tell you about the NPA in a little while. We're doing another paper on Phillip's thesis. There was an experiment that was done in 1830 by Faraday. Faraday was pretty good, except he was just an experimentalist. He wasn't good in the theory. He was good in doing experiments. And he did an experiment on a unipolar generator, which you can't explain by Maxwell's Equations. If that experiment is valid, and I think it is, and you can't explain it by Maxwell's Equations, then something is wrong with Maxwell's Equations. Now, you've heard of Gauss, I presume.

McDonald: Yes.

Spencer: He's one of the greatest people in the 19th Century in Science.

McDonald: Yes.

Spencer: And Gauss was very thoughtful, he didn't rush into publishing everything. But he did make a statement on electromagnetic theory about 1860 that—shortly before he died—that said, that somehow electromagnetic theory should all be somehow derivable from a single equation with the force between moving charges, which is
a function of relative velocity, not absolute velocity. In the 1890s, it was derived by someone that we refer to in our papers, that Maxwell’s Equations can be expressed in terms of a single equation as the force between moving charges, but that has two wrong terms that depends on the position and varies inversely as the square of the distance and then it has a velocity term which is a function of, not relative velocity, but absolute velocity, and then it has an acceleration term. The acceleration term has two parts: and the first term, most of the interesting things in electrical engineering fall out of that term, but that velocity term with those absolute velocities in it doesn’t agree with Gauss's idea. So one of the things that Professor Moon and I did was to find a formulation that we called the New Gaussian Equation, because it's Gauss's idea, but we applied it, an equation for the force between moving charges that's a function of relative velocities and what we want to do next is a book that will compare Maxwell’s Equations and the New Gaussian Equation with all the applications in electrical engineering. And that is something we've done most of the work on I think, but we want to write it up in a book instead of many papers.

McDonald: That's cool. Very interesting.
Spencer: Now another thing that I'm working on is the, um, Natural Philosophy Alliance. This is an organization that's been in existence for something like 16 years now.
McDonald: Okay.
Spencer: And I was Vice President of it from the beginning and now I'm President of it and we're going to be having meetings at the University of Connecticut the last week in May, five day meetings, at which we try to discuss the foundations of physics, the foundations of science. There are a lot of people in that group that for one reason or another believe that for one reason or another there is something basically very wrong about physics as it is taught today, that the universal time concept does exist. It is meaningful for us to be able to say that at this instant something is happening in California or Australia or New Zealand or anywhere else in the world.

McDonald: Okay.
Spencer: Does universal time mean something or doesn't it? Instinctively, you think it does and physically it does and you can with the kind of communication devices we have today down to very great precision apply this idea of universal time to everything. And that needs to be investigated and then whether Maxwell’s Equations should be replaced. The New Gaussian Formulation needs to be investigated. And I think we put in one book, the things on the universal time and in the other book the things on the basis of electromagnetic theory.

McDonald: Makes sense.
Spencer: And those are the next two books after the one we're working on now. So, I have all kinds of ideas of things I would want to do and fortunately there are some people who are interested in these ideas too and we have a society where we can all agree.

Mascardo: This is a picture of Susan Hockfield and Domina.
McDonald: Cool.
Spencer: Well, look at that! There is Nikki. Can you email me this—or Patricia, since you have her e-mail address. Can you e-mail Patricia those pictures and stuff, too?
Mascardo: Do you want these, too?
McDonald: Yes, you might as well.
Spencer: And now, Terri, come here.
Mascardo: She was in the Integral Magazine, too, at the department. They did a big feature on her in there. Did Margery, um, forward it to you?
Spencer: Who are these two people, did you say?
Mascardo: That's Susan Hockfield and Mike Sipser, former the head of the Math Department.
Spencer: Oh, yes.
Mascardo: Remember when we went there last year for the meetings? Yeah, I told Margery the Integral magazine did a feature on Domina not too long ago, a few months ago.
McDonald: If you could e-mail that to Patricia, it would probably be good.
Mascardo: Okay.
McDonald: Margery can be a little forgetful.
Mascardo: So who is Margery anyways?
McDonald: She she works in the Spanish Department...
Mascardo: Oh, okay.
McDonald: And she's in charge of some Women's Studies stuff, and she's in charge of the whole women's initiative, and she was actually the lady whose been real instrumental--like she pushes for women's stuff in everything.
Mascardo: It's like a Women's Studies course you're taking?
McDonald: No, this is just a UROP. Like a random UROP thing.
Mascardo: Oh, cool. Because I didn't know who she was and I was so glad that she gave me Patricia's e-mail. Because I was like, sigh. And here is another picture that you guys can look at.
Spencer: So, you see some of the things we want to work on, and some of the things we have started. Look at that! That is nice.
McDonald: Susan Hockfield started the wave the boy's basketball game the other day.
Mascardo: She did? Alright! MIT has a basketball team?! Not quite like Connecticut's, though.
McDonald: They're really good this year.
Spencer: This is the MIT President here. And I'm here.
McDonald: Yes, Susan Hockfield.
Mascardo: I had a friend who graduated in Physics at UConn and then he went to MIT for a PhD in Materials Science and now he's a patent agent in Vermont. And so I say, "What was the best thing about going to MIT, Tommy?" He says, "I got to play sports, because I wasn't good enough at Connecticut." He goes, "I got to play all the time!"
McDonald: He probably played like club sports and intramural sports.
Mascardo: Something like that, yes.
McDonald: I'm in charge of the intramural program at MIT, so...
Mascardo: That's great. I was in that when I was an undergrad. I loved it. Do they still have games at like midnight and stuff?
McDonald: Well, they usually try to have them end by midnight, because most of the facilities shut down by 11. And then the lights go off on the fields.
Spencer: Go find the other girl.
McDonald: Hi, I like you, too.
Mascardo: She'll jump in your mouth, if you let her.
McDonald: Well, she just cleaned out my nose for me. I'm sure that was tasty.
Mascardo: We're so lucky to have two Christian women here. I mean, gosh!
Spencer: It's wonderful!
McDonald: It's cool. And at MIT, we randomly—well, we live in McCormick, which Katherine Dexter McCormick financed.
Mascardo: Right.
McDonald: And then there are two towers and then how there used to be—well, you would remember. There were all those row houses. They actually, they didn't, they destroyed most of—they leveled most of them to make all the dorms, and they left one of the still standing between Ashdown, which is right on the corner...
Mascardo: Ashdown, that's the one I remember.
McDonald: Off Massachusetts and Memorial Drive, and as you go this way is all the rest of the dorms. They left one row house standing. They have it, and it was the religious building for a little bit and different things. And then they converted it to dorms. And that's where Patricia and I live, is in that row house.
Mascardo: Awesome.
McDonald: So it's really cool.
Mascardo: Oh, that must be really nice. So how many people live in that whole thing?
McDonald: So there are 24 of us that live in the Annex, that's the little row house. And then overall in McCormick, there are 260 girls?
Spencer: Yes, it's very nice.
Widener: And very convenient.
Mascardo: Wow! 260!
McDonald: There actually about 500 of us per class. It's about 2000 out of 4000.
Widener: 500 what per class?
McDonald: 500 girls per class. 'Cause there's a little over 1000 per class.
Widener: Okay.
Mascardo: Now there's twenty something in your one building?
McDonald: Yes, in our little house...
Widener: ...That's annexed on to McCormick.
McDonald: Yes, that's the Annex. Yeah, McCormick's a nice place. It's really well...cleaned.
Mascardo: Really well cleaned, that's nice.
McDonald: A lot of people are like, "So you live in the hotel, right?" And we're like, 'Yeah..."
Mascardo: Yes, that works for me.
McDonald: Well, there's a lot of coed housing. And then, I don't know how many fraternities there were when you went, but now there are 26. So, half...
Spencer: 26? I have no notion how many there were when I was a student. I just knew about the ones I passed.
McDonald: Yes, most of them are—
Spencer: But well I, when I was a student, I got all kind of invitations when I was coming to MIT to join the fraternities. A Fraternity! Not a sorority, but a fraternity!
McDonald: And you were like, "Um...."
Spencer: And with my name Domina. You know what that means in Latin? "Lady" or "mistress" or "one to be obeyed." But "Lady" is probably the best translation, but...
that's as feminine a name as you can get. And everybody was sufficiently ignorant of Latin.

McDonald: But they were like, "Come to our Frat!"

Spencer: They sent me invitations when I was coming to MIT.

Mascardo: So, have you guys lived in the same place the whole time you've been there?

McDonald: Yes, we were actually randomly assigned as freshmen.

Mascardo: Oh, yes?

McDonald: Well, more or less randomly assigned. We met during—they have Campus Preview Weekend.

Mascardo: Right.

McDonald: It's in the Spring for people who got into MIT to come see the campus before they have to decide whether they're coming to MIT or not. And we met during that at one of the—well, the two girls we were staying with were both Christians and they introduced us to each other, and were like, "Why don't you guys hang out together?" And so then we hung out and were like, "We should room together! You're not crazy. And I'm not crazy."

Mascardo: That's so good to know. Because when I used to hang out at MIT in the '80s, there weren't many Christians around.

McDonald: Yes, there's actually 16, 17 Christian organizations on campus.

Widener: Christian fellowships. Yeah, we have a very strong Christian community.

McDonald: Yes, it's not huge, but it's significant.

Mascardo: Yes.

McDonald: It's one of the things that I really liked about MIT actually was that there was a significant Christian—

Mascardo: See that's really changed.

McDonald: I mean, I wouldn't say that we're...well, 10% would be like 400.

Widener: Yes, no. We're not that big.

McDonald: So, it's less than 10%. Like actually 10 fellowships are...

Widener: But the people who are, like...people at MIT don't say that they're Christian and not mean it. If they say that they're Christian, they really mean it. So in that way we're really strong.

Mascardo: That's wonderful.

Widener: We have to learn to live in peace with one another.

McDonald: Yes, I mean, nobody's militant of anything like that.

Mascardo: Yes, you're like, our department they're like, at one time they were like 75% Jewish, don't you think? In the Math Department. You know, there are a lot of Jews.
Spencer: Well, quite a few.
Mascardo: But at least through, we have a lot of Jews who have Christian leaning, if that makes any sense.
Spencer: Some of the... Stu Sidney in my department is one of the best Christian people I know, in the way he acts. He takes care of his wife who has been crippled and in a wheelchair for many years; as though, it's the greatest joy, he's perfectly wonderful with his students.
Mascardo: His son Ray was the fifth employee at Google. So he retired after four years. He graduated MIT in the mid-90s. And then he was out there before they even had offices and before they went public and all that.
McDonald: Yes, Google!
Mascardo: He's just like an amazing person.
Spencer: Now, I think I met him last Sunday.
Mascardo: Ray, I don't think Ray was there.
Spencer: But I'm not absolutely certain. Two of the three boys were there.
Mascardo: Larry probably, and Dan. Dan works at MIT, so...
Spencer: And one whose wife was about to have a baby was not there because the baby was almost due.
Mascardo: You met Dan and Larry. Larry's the, uh, the physical education teacher. And Dan's the biomedical engineer.
Spencer: All I know about them is that they both look like their father.
McDonald: Cool.
Spencer: They look an awful lot like him and he's one of the very nicest people in our department.
Mascardo: Yes, you can't really tell he's Jewish or Christian or whatever. He's such a nice person.
Spencer: But, he was born Jewish.
Mascardo: That's good. MIT has some really good Christian Organizations that are really hard core.. kind of.
McDonald: Yes, yes. It's really nice to have that. It beats pizza and playing in youth group in high school by a million miles.
Mascardo: Yes, because when I was-In the '80s, it seemed very sterile. You know back then. I don't know, just very, very sterile in every way.
Widener: There's a large movement on campus towards social justice and fixing problems like poverty and things that, but it's also very, very strong within the Christian groups on campus. So I know many of the groups are really passionate about that... so, that's awesome.
Spencer: Well, I'm delighted to know about these things!
McDonald: Yes, like there's actually, they have a big week long thing. It's called the Global Poverty Initiative. A bunch of the people in the fellowship I attend are in charge of it. And so it's all about making people aware of what's out there and how it works. And really anything that you do, you can't help but inflect God into it somehow. So even though this isn't, it's not about like sharing the Gospel or anything like that. Just by the people who aren't Christians who come or who work with my friends who are Christians on the Global Poverty Initiative and stuff like that, see that their drive comes from somewhere else. Comes not just from caring, but from
a deeper caring. Which is really cool because then you get all those kind of conversations.

Mascardo: That's nice.
McDonald: That's one thing I liked about MIT. Because people, even if they're like, "I'm an atheist," they're really open to talking about it, like why they are, why they aren't, or why they don't care about God. Or just about anything. People are really open to discussing it...

Mascardo: Like sharing.
McDonald: ...And not like yelling at each other like, "You're an idiot. I can't believe you blah, blah, blah." They're like really talking about stuff like that. They don't necessarily change their mind or anything, just to like be able to see the other side of things, which is really cool. I don't know. I thought it was really cool.

Mascardo: Great.
McDonald: Yes, MIT.
Spencer: Well, it was nice to meet both of you. Would you like to come down and visit me for lunch or dinner some time?

McDonald: That would be fun.
Widener: Yes.
Mascardo: You'd better clean up the living room, though. Yeah, you could take the T there.
Spencer: Well, it's a five minute walk from where you live.
Mascardo: No it's not. You just told them you took about an hour to get to MIT. Come on now!
McDonald: Well, you have to understand, though Patricia—I go to church right near Tosconini's, the ice cream place by MIT. So, it's like a ten minute walk for me. Patricia walks like what? 3 miles to church every Sunday?

Mascardo: She goes to church in Brookline. Where do you go to church?
Spencer: In Brookline.
Widener: I go to church in Porter Square.
Mascardo: Oh, Porter Square.
Widener: Yes.
McDonald: I go to church at the Pentecostal Tabernacle. It's awesome. I never went to a Pentecostal Church before I came to MIT. So, I was trying out churches and it's just epic.

Widener: I'm currently at a Baptist Church.
Mascardo: Oh, you are?
Widener: Yes, so.
Mascardo: I'm at a Congregational, I guess, so...
Spencer: I don't think the denomination matters too much.
McDonald: I agree with you.
Spencer: The basic thing is that we're Christians.
McDonald: Yes, I totally agree with that too. It's about finding—when you look for a church, it's about finding a pastor who actually preaches the Word of God and not like whatever his random opinion is and stuff like that.

Spencer: And last Sunday... that was last Sunday, wasn't it? Yes, I think it was last Sunday. I, for the first time in my life, gave the sermon in our church.

McDonald: Oh, really?
Spencer: And Nikki goes to church every Sunday. And when I gave the sermon, she was in my arms.

McDonald: Did you have fun, Nikki? I'll take that as a yes.

Spencer: She was good, very good.

Widener: She's a very well behaved dog.

Mascardo: Yes.

Widener: I'm very impressed.

Mascardo: So, you want to do something international, I think. And you don't want to go back to California, you said, right?

Widener: Yes, no, actually I'll be studying at the real Cambridge at the University of Cambridge next year.

Mascardo: Oh.

Spencer: You will be?

Widener: Yes, so I'm really excited about that, but we'll see.

McDonald: I'm losing my roommates next year.

Spencer: That's wonderful.

Widener: Is it just for a year?

Mascardo: Yes, for a year so.

Mascardo: That's good.

Widener: And I also really like Turkey. So, I've been thinking about doing my graduate work in Turkey at one of the English speaking universities there.

Mascardo: Wow.

Spencer: My sister almost went to Turkey to do some graduate work one time.

Widener: Hey!

Spencer: But she didn't.

Widener: It probably would have been at Boğaziçi University

Mascardo: Have you ever been there?

Widener: I went once and I really liked it.

Mascardo: Oh yeah?

Widener: I went over spring break on a mission trip to Turkey.

Mascardo: Really? For how long?

Widener: It was a week long, but we worked in a community center. So, they teach English classes and things like that. And it's really cool to see and you know, it's cool because you're more than a tourist. You know? Because you're with people who live there and you don't just see the tourist areas and you really see how it is there. And you have gorgeous high-rise apartment buildings next to illegal housing without electricity or plumbing or anything.

Mascardo: Wow.

Widener: And just to see that contrast is really striking.

Mascardo: So, is that what you liked best about it? Just the simpler way of life or?

Widener: So Turkey's like a really secular nation. But once again, you have this contrast between the old and the new.

Spencer: So, you're going to Cambridge.

Widener: Yes.

Spencer: I have been there only once. We went to England when we didn't have any pets. They had died and we, uh, carefully took this trip before we had pets.
Widener: Aww.
Spencer: And my whole family, that is my husband, my son, and my mother and my sister, the five of us all went to Europe and spent the whole summer over there. And went to England, the only time I've been to England. You can't take her [Nikki] to England. I can take her to Russia. She's been to Russia—how many times have you been to Russia? I've been there four times and she's been there twice, I think. Something like that. Maybe I said that wrong. But in any case, I've had her and she has always been with me when I've been to Russia. And, uh, but England, you can't bring a dog into without six weeks putting them in quarantine. And I wouldn't do that to any dog; put them in a cage for six weeks. So, I've only been to England once. But I loved Cambridge, it was beautiful. Very lovely.

Mascardo: So next fall you'll be there?
Widener: Yes, so I'll actually be there for a whole school year.
Spencer: Oh, for a year. That's perfectly delightful. And you're graduating this year?
McDonald: No.
Mascardo: No.
Spencer: Next year?
Widener: No, two years.
Spencer: Two years.
McDonald: We both have two years left to go. Almost half way through. After finals, we're half way there.
Spencer: Oh, so you're just half way through.
Widener: Yes, we're not going to graduate in two years like you did.
McDonald: Yes, we're actually staying for the full four.
Spencer: I don't necessarily recommend everybody try to graduate in two years. But if they won't give you a scholarship, it's one way to get a degree from MIT. I mean if they give you ten percent!
McDonald: They don't give you any money, do they, Patricia?
Widener: Nope.
McDonald: It's all need based. It's different now. It's all need based.
Mascardo: Really? So everybody has to put in like a financial whatever.
Widener: You submit all of your tax forms.
McDonald: It's based on...
Widener: And your scholarship is just completely based on tax forms.
McDonald: Yes, and your scholarship is based on what your parents make and how much they think your house is worth and stuff like that. Which is very different—which is also—they calculate it really poorly. 'Cause I know I can't afford what they're making me pay.
Mascardo: That's crazy.
Spencer: Well when Euclid was a student at MIT, my son, why he fortunately because of his father, had a full scholarship.
McDonald: Yes, if dad was a—
Mascardo: Yes, but he went to BU first.
Spencer: Hmm?
Mascardo: Yes, but he went to BU first before he transferred over.
Spencer: He couldn't get in at the beginning.
McDonald: But he was able to transfer in?
Mascardo: Back then it was easier to transfer in.
McDonald: Oh really? Yes, because now they only accept 8 to 10 people a year, transfer students a year.
Spencer: Well, he got in that way.
McDonald: Because I know two of them and they’re so smart.
Spencer: But he didn't go to school at all around here, until the year before he went to college.
McDonald: Did you teach him at home or?
Spencer: I taught him. My mother taught him. My sister taught him the most.
McDonald: That's cool.
Spencer: And she enjoyed that immensely and I think it was good for him on the whole. But, when it came time to go to MIT, there was a little difficulty.
McDonald: Yes, that makes sense.
Mascardo: It's so competitive now with everything.
McDonald: Yes, it's intense. Are we in— I think we're down to 11% acceptance. We're trying to get in the single digits. Yeah, it's crazy.
Spencer: But, would you like to come down to see me sometime?
McDonald: Yes, that would be cool. We could meet for dinner.
Spencer: For dinner?
Widener: That'd be awesome.
McDonald: That'd be cool.
Spencer: Well, when would you like to come?
Mascardo: What do you think about waiting until they get done with exams?
McDonald: I was just trying to think because I leave almost right after my exams are over.
Mascardo: They can e-mail me.
McDonald: Yes, and then Patricia's actually going to be in Boston this summer.
Widener: I'll be here all summer.
McDonald: I'm actually going back to Pittsburgh. But she's working here all summer.
Spencer: Oh, so you'll be around all summer.
Mascardo: Are you going to live on campus still or?
Widener: No, I just found an apartment in Porter Square.
Mascardo: Oh!
Widener: I wrote out the check today, so...
Mascardo: Great.
Spencer: Very good. And what are you doing in the summer?
Widener: I'm working for Novartis.
Mascardo: Oh, I've heard of them. Who are they?
Widener: They're a pharmaceutical company.
Mascardo: Yes, yes.
Spencer: Sounds interesting.
Widener: I'm pretty excited because their ranked as one of the most ethical companies in pharmaceuticals and they're very, very good to working mothers and just all around a good company.
Mascardo: Good.
Spencer: Very good. Well, if you can figure out when you can spare the time, I'll try to be in Boston.

Widener: Okay.

Mascardo: Or if you can spare the time.

McDonald: If our schedules can mesh.

Spencer: Well, all I have to do is grade papers and turn in my grades. I have to do that by late Monday. So, any time after Monday.

Widener: Okay.

McDonald: And if it doesn't work out in the next week and a half, I'll be here all—I'm, I'm not going overseas next year. I'll be here.

Spencer: You'll be here.

Mascardo: You must be so excited.

Widener: I'm so excited.

McDonald: And I'm so jealous.

Widener: I get to find out my college on next Friday. So, I'll find out my actual college at Cambridge.

Mascardo: Remember when we were in Florence? I remember we saw this girl...I don't remember what we were doing. First of all, I'm doing all the driving and I have no idea how to get to Florence and I'm driving along, see all this clay in the country side and they're so many exits that say, "Firenzi" "Firenzi". You know, Florence, right? So I'm thinking, "I got to pick one of these, right?" And it's the right one, you know. You see the statue of David, it's actually three or four statues of David until you get to the real one. So, we go down into the square and we were walking not this dog, but Hypatia. We were trying to get into the hotel and there was some reason why we couldn't, so we had to wait in a courtyard and we saw this girl there. And she was from McGill University up in Canada, right?

McDonald: Oh, in Montreal.

Mascardo: But what she was doing is that she was taking some course in Italy there and she was waiting for wherever she was living to open up. She was telling us the whole story, and then so, she said she was Egyptian.

Widener: Whooa.

Mascardo: She was Egyptian, going to school a McGill, now going to Italy to take something in Italian or whatever. And so she says, I asked her, "What was Egypt like?" And she says, "You don't want to go there because you could be just driving along and there's a camel." She said there's like all this stuff going on because I was complaining about when I was driving into Florence, I couldn't tell what a sidewalk was and what was a road, you know? So I was just driving along and there are people just crossing here and there. And she goes, "Oh no, I've got that beat." She says, "Egypt." You know, she goes, "Camels alongside the cars." And all this stuff and I'm like, "Really?" And so that reminds me of what you're going to be going through, some place totally different and living there and going to school there and all that. That's cool.

Spencer: But that will be fascinating to be in Cambridge. And it's beautiful.

Mascardo: And Turkey! Gosh, she'll have a lot to tell you when she comes back.

McDonald: I know.

Mascardo: Yes, she'll have a lot to tell you.
McDonald: She'll be sending me a letter like, "Well, you know I walked up the Eiffel Tower today. Took a weekend trip."

Mascardo: When you get back to Pittsburgh, are you going to do anything special?

McDonald: Yes, I'm interning with Bayer. Bayer aspirin, Bayer Flintstone. I'm actually interning with their Material Science side. I did it last summer, too. I'm working in logistics and network optimization and stuff like that. So it should be really cool. And it's 20 minutes from my house too, so my mom and my boyfriend are so ridiculously excited. They're like, "Oh, my gosh. You're coming home."

Mascardo: And you said you were home last year doing that right?

McDonald: Yes. So, they're like, "You're coming home again. Yeah!"

Mascardo: Wow. Yeah, that is cool.

Spencer: And the things at MIT are lasting a little longer then they are at Connecticut this spring then. Since my classes were over a week ago.

McDonald: Yes, next week is our last week of classes, then the week after that is finals.

Spencer: You're two weeks different from us.

Mascardo: And commencement must still be on a Monday, then at MIT, right?

McDonald: I don't know. Commencement is in June, right?

Widener: It's like June 5th.

Mascardo: Wow.

Widener: There's a long break in there.

McDonald: It's like a week and a half or two weeks. Two weeks, I think it is actually. It's really weird.

Spencer: Do you have my phone number?

Mascardo: I think they should e-mail us because I think the whole phone thing isn't going to work very well. They should just e-mail us because of the way Euclid has it set up.

Spencer: Can you figure out when you can come and...

McDonald: Yes, we could do that. That would be easy. Because then Patricia has your e-mail address and...

Spencer: I don't know when I'll be coming down for the NPA meetings, but we'll see what time I have.

McDonald: I'd actually be really interested in that paper on mathematically defining the Trinity.

Spencer: Mmmmm.

McDonald: That would actually be really cool. Do you have a copy of that somewhere?

Mascardo: Do you have a copy of that?

Spencer: Well, I will...

McDonald: Well, you probably can't release it now, but if you could later, I'd really want to read that and share it.

Spencer: Well, I have to get that in readable, reproducible form. But I think he's had an idea that may be helpful to some people.

McDonald: Yes, that's what I was thinking.

Spencer: And if it could bring Chris Peek back to his religion, then there may be many people that would find this desirable. And that is what I'm supposed to be presenting.

Mascardo: What do you know? It's right here. I think this is it. Is this the thing that Chris sent?
Spencer: Let's see. That is one of the versions, yes.
Mascardo: So, what did you do? Edit it or something?
Spencer: No, he has a second version, too.
Mascardo: We're going to have that last chapter in this book on that. Somehow Chris will write some of it and I will write some of it. But, if that can be helpful to Chris Peek, who was a very smart and very nice person, and yet lost his faith for many years, maybe it will be helpful to other people.
Widener: I think it will too.
Spencer: I think it's worth doing.
Mascardo: Yes, Chris came up with that all on his own, right?
Spencer: I have a version that's a later version. That's the first version. That Chris sent me.
Mascardo: What course was Chris in at MIT?
Spencer: He was in Course 6, Electrical Engineering.
Mascardo: Okay.
Spencer: I believe. I'm pretty sure.
McDonald: I like how the universe is created. It has it in units. "The universe was created in 10 to the negative 45 seconds."
Spencer: All kinds of interesting things he's collected data on.
McDonald: It's really interesting.
Spencer: I have a later version that he sent me just recently. Somehow we're going to condense that, revise it, and somehow we're going to turn that into a chapter in the book. And meanwhile, the principle idea is in a paper for the NPA.
McDonald: It's pretty cool.
Spencer: And then, you're going to Turkey for?
Widener: Well, I took one trip there. And I was actually thinking about getting my Master's in Turkey. Boğaziçi University was founded as an American University, and so they're still an English speaking campus and they have a very good chemistry department.
Mascardo: Wow.
Spencer: That's the school my sister almost went to.
Widener: Yes.
Mascardo: What's it called?
Widener: Boğaziçi University.
Spencer: The invitation to go there came while we were out in Chicago for the summer. And, my grandfather saw the telegram and thought it was very important and carefully saved it for us, until it was too late to do anything about it.
Mascardo: So anyway...
Spencer: But you, do you have my email address?
Mascardo: We have everything we need, Domina. Don't worry.
McDonald: We have email addresses.
Spencer: So, you let me know when you have some time, and I'll see if I will be in Boston then. Generally, I'm down here working with Terri some of the time. And up there and at the university...one of the three places.
McDonald: The three places where you live.
Mascardo: So what do they have to do... what else do they have to do at MIT? Like, back in the eighties, the most that they ever had was movies, do they have a lot more to do now?

McDonald: Well, we have LSC, which is probably what you’re thinking of. But there are a ton of a cappella groups and dance performance groups.

Widener: Plays all the time.

McDonald: And plays all the time. There’s a play at least once a month.

Widener: At least once a month, yeah.

McDonald: A student performed play because they have the Shakespeare Ensemble, the Musical Theater Guild, Gilbert and Sullivan Players, and Playwrights in Performance—which is actually student-written plays performed by other students.

Mascardo: And they have intramurals, right?

McDonald: Yes, intramurals.

Widener: Sports.

McDonald: Yes. Club sports, varsity sports. Thirty, no forty-one minus eight is...

Widener: Thirty-three

McDonald: Thirty-three now. They have thirty-three sports now; they just cut eight varsity sports.

Mascardo: So do you guys think you spend most of your time on campus, or...

McDonald: Yes, I don’t go off campus.

Widener: Yes, definitely.

Mascardo: Well, Cambridge is one of the nicest places.

McDonald: Cambridge isn’t that bad, and Boston is not that far away either. But it’s a matter of workload.

Mascardo: Workload. Yes.

McDonald: And then everything else you’re involved. I’m involved in the Model United Nations Club and we organize different trips. I spent spring break in The Hague, in the Netherlands. Last year, I spent it in Pueblo, Mexico, attending some conferences.

Spencer: Lovely.

McDonald: Yes! I had never been to Mexico before either. It was fantastic.

Spencer: Well, I’ve only been across the border into Mexico with Hypatia once. We walked across the border. Nobody bothered us. We walked right into Mexico for maybe half an hour.

McDonald: That’s cool.

Mascardo: Yes, one thing about MIT, it does have an international flair both inside and sort of out, too. I met this one guy from Morocco once at a party—unfortunately, he committed suicide— he was a friend of Domina’s son, and his name was Younes. I thought isn’t that a girl’s name, you know. It was spelled Y-O-U-N-E-S. So I go, “What kind of name is that?” And he said, “Moroccan.” And I said, “Oh.” We were in his room and he had this big chunk of silica. He says, “Be careful! Because parts of it are wafer thin you could cut yourself.” He was the most unusual person I met from a far away land with a very different name.

McDonald: Yes, I don’t know. There’s a girl who lives in the Annex, she’s from Tanzania.

Mascardo: Oh yes!
McDonald: She’s a freshman from Tanzania, she’s really awesome. And then we have another girl who lives, another girl from China, and a girl from India. I’ve been involved in the Model UN and there are a lot of international students who are involved in that. I went to the Netherlands with two people and half of our delegation was international students; a couple of people from India, a guy from Tanzania, and a guy from Taiwan, too.

Mascardo: Wow.

McDonald: So it’s really cool, all different people you get to know.

Spencer: I think meeting the students from other countries is one of the delightful things about teaching.

McDonald: It’s something, well, the level of diversity. Well, I come from Western Pennsylvania so it’s basically all white. So this is the first time I have ever lived with people of Asian descent before, or anything else.

Mascardo: Yes, Patrick’s from Ghana. You know, West Africa. And when I first met him his real name...well, this is his real name, right here. Patrick was his Christian name, he gave himself that name. You know, I guess in Africa, you can pick your own Christian name. His real name is Dzifanu. So guess what my godson, he says, “What’s his name?” I said, “Jifanu. His family calls him Jiffy or whatever.” So he says, “No, it’s Dzifanu. Dz, you know, it starts with a J.” “So I was thinking about just calling him Jeff.” He goes, “No, don’t call him that. Call him Jafar, like in Aladdin.” You know, so that’s what his name is now, Jafar. He goes, “Just call him Jafar, like in Aladdin.”

Spencer: Unusual.

Mascardo: He probably looks like him in there. Yeah, so that’s why no one calls him Patrick now, they just call him Jafar. Yeah, Jafar. Yeah, it’s cause Zachary gave him that name. Zachary, that’s my godson. When he was little, and hopefully, if he passes his exams that he had Friday, he’ll be graduating on Saturday...a week from today.

Widener: Graduating from?

Mascardo: He goes to Mitchell College, which is a private college in Southeastern Connecticut on the river, he’s in graphic arts and business.

McDonald: So what is one of your favorite memories from being a student at MIT? Top three.

Mascardo: Top three. Go!

McDonald: And your husband doesn’t count.

Spencer: Sailing.

Mascardo: Sailing.

Spencer: And my classes.

Mascardo: One more?

Spencer: Particularly the classes with Struik in mathematics and the classes with Parry in field theory and in illumination.

Mascardo: You got to pick one more, she said three.

Spencer: Three?

McDonald: And they can be actually moments, too.

Spencer: Well, Stratton was pretty good too, and the Mexican professor, Vallarta, he was very good. I always thought he reminded me of my Chihuahuas.

Mascardo: Because he was little?
Spencer: He was not very tall, and he must have had infantile paralysis or something when he was a child, because his legs were different lengths. And when he walked, he went up-down, up-down. And the first time I met Vallarta, I had him for two courses. The first time I met him, he was suppose to teach me theoretical physics, which was a big senior course, that I had my second year at MIT. And he was not there. So Professor Stratton was teaching the course. And Professor Stratton made everything look so beautiful and simple and taught with a nice, slow, gentle pace. Professor Vallarta didn’t come back from Mexico, and he didn’t come back from Mexico for about four weeks. And then suddenly, I had decided to do my Doctor’s—my Master’s—my Bachelor’s thesis with Stratton, which I did. I spent most of the time standing outside his door. Do you know why he was so busy and never there? He was having his third daughter. His wife was, but it seemed that he wasn’t ever at MIT at that period. He was a very, very good person. When he was there, he was worth waiting for. But Vallarta came back that day, and instead of this nice, slow, gentle pace lecture on just mechanics and the beginning of theoretical physics, suddenly, it was this little Mexican, and he went doot, da doot da doot. He went as fast as a Chihuahua running back and forth and back and forth. He taught us two or three times as much in an hour as Stratton ever taught us. And he made it all clear, too. That’s really wonderful.

McDonald: That’s impressive! He made it all clear.

Spencer: Oh, I liked Vallarta very, very much. And then I had him after that when I was a graduate student for a course in relativity. That was the only course I had at MIT in which there were four girls, including me.

Widener: That’s impressive.

Spencer: But Vallarta made that clear, and I didn’t yet know that nearly everything in relativity is wrong, which I spent a lot of time proving since then. But, that was my first exposure to it and it was very pleasant and he made it all seem as though it was right and then it took me, about twenty years later, I began discovering it was all wrong.

McDonald: But it was very clear.

Spencer: But Vallarta was a delightful professor and a delightful teacher, yet he always reminded me of my Chihuahuas because he was so little and so fast.

Mascardo: Can you think of one moment that doesn’t involve Perry or teachers that was very exciting for you?

McDonald: Yes, something that you did.

Mascardo: Yes, like something that you did.

McDonald: Like posing for photos on the roof...

Mascardo: Think of a moment that sticks out...didn’t you say that you looked out the window and you saw your boyfriend standing out over by the fire hydrant or something waiting for the streetcar. You’d always just...he was looking at the CITGO sign.

Spencer: Oh, well Tommy used to sit on the fire plug that was on the corner of Massachusetts Avenue and Memorial Drive on the side where the graduate house was.

Mascardo: After he had been at your place, then he’s go down there and take the street car.

Spencer: He would go down there and take the street car across the bridge over to Roxbury where his family lived.
Mascardo: Right, and you remember that pretty clearly. That was a good memory of someone.
Spencer: And..., then I remember the other boy, remember what’s his name?
Mascardo: Howard Blanding?
Spencer: That used to hide behind the bushes.
Mascardo: Howard Blanding!
Spencer: Just after I crossed the street and he tried to jump out at me.
McDonald: Did he scare you?
Spencer: I never liked him.
Mascardo: I found his picture in there, you know. I found his picture in there, he kind of looks like he’s a...
Spencer: What’s his name?
Mascardo: Howard Blanding!
Spencer: Howard Blanding, yes.
Mascardo: Yes, he had a crush on you, right?
Spencer: Oh, he followed me everywhere.
Mascardo: Stalker.
Spencer: And especially, he hid behind those bushes.
Mascardo: And then he’d pop out at you, right?
Spencer: But...
Mascardo: And he’s the guy who made you capsize because he was smoking in the boat, right?
Spencer: He didn’t make me capsize. But the only time I ever capsized in all the years I went sailing was when he got in. I had to use him as a crew. You have to have a crew to go out, and he was the only one available. And so I used him as a crew. It was Halloween. It was sort of late in the fall; things were a little bit cold. And he got in there and was my crew. I had to have him if I wanted to be in the races, and I wanted to be in the races. And then he produced a pipe and lit it. And I was so mad that I capsized.
McDonald: On purpose or by accident?
Spencer: Not entirely by accident. Not entirely deliberately.
Mascardo: You were trying to put out that pipe, weren’t you? (Laughter)
Spencer: Yes, I never...
Mascardo: Anyway, how deep was the Charles back then? They didn’t dredge it. How deep would you say the Charles is?
Spencer: Oh, it’s very much over anyone’s head.
Mascardo: I know that, but how deep do you think it is?
Spencer: I don’t really know. I didn’t investigate the Charles...
Mascardo: I know what moment! Domina, what about the time that you and your boyfriend Tommy had to take all those books up to Marblehead?
Spencer: Oh, we took a whole string of books to Marblehead. That was fun...
Mascardo: And she got lost for like an hour.
Spencer: Except on the way up there when we got about half way out.
Mascardo: Just let us know when the time is up.
McDonald: Oh, what time is it?
Spencer: We were so far out that we couldn’t see land and the fog came in and we couldn’t find the land at all.

Mascardo: We’ll get you there.

Spencer: Then I wondered...

Mascardo: No, what did you say? Tommy didn’t try to take advantage of the situation.

Spencer: No, Tommy didn’t try to do anything except try to...

Mascardo: Well, he found his way up to Marblehead, right?

Spencer: Found his way to Marblehead, and I’m alive and here.

Mascardo: They were out in the Atlantic Ocean somewhere, you know? That must have been pretty tough for him to read that fog. So that was a memorable time at MIT.

Spencer: Well, we kept going and thought we were going in the right direction and his guess was good. He was smart at things like that.

Mascardo: Yes, I’m trying to think of what else to say.

Spencer: He wasn’t smart enough to ever get his degree at MIT. I kept trying to tutor that boy and help him with this differential equations, the sophomore course in differential equations was as far as he could get. He was a chemical engineering major, and he...

Mascardo: Well, he had to work.

Spencer: Despite my tutoring, he never could pass his math classes.

Mascardo: But he had to work. You never had to work. He worked how many jobs?

Spencer: Well, he worked weekends at the sailing pavilion on Saturdays and Sundays.

Mascardo: And then he had to commute in, right?

Spencer: And he commuted. And he didn’t seem to know how to study.

McDonald: You really have to learn how to study at MIT.

Mascardo: You do.

Spencer: Well, in many ways it was easier than Friends Select.

McDonald: Really?

Spencer: Yes.

McDonald: Interesting. It was significantly harder than my public high school.

Spencer: And I’m very grateful that I had the high school education at Friends Select.

Mascardo: Do you think it is just that they teach the subject matter harder, or just the volume of things, or both? How would you describe why it’s difficult?

McDonald: I think that it’s a lot of—it’s like drinking from a fire hose. That’s like the tagline for MIT. But, no, they put a lot of—like the freshman chemistry course that we took, 5.112, they cover the same material, cause I took some courses at Penn State my senior year, they cover the same amount of material in two or maybe three semesters at Penn State. And so you’re halfway on your way to a chemistry degree by the time—at Penn State—by the time you finish the material we covered in...

Mascardo: One semester.

McDonald: For one semester of freshman chemistry.

Widener: Intro to Chemistry.

McDonald: So it’s the volume of stuff and then because it’s so compact. And then they also make it difficult.

Mascardo: So it’s both.
McDonald: So it’s both. But sometimes I think it’s more the volume than it is necessarily even how hard the material is. Just how quickly they’re like “Eat this. Ok, move on.”

Spencer: And then you have good students. Everyone that is at MIT is a good student or they’re not there.

McDonald: Yes, they’re really good students. The thing that was hardest for me was learning how to study with—learning how to work with other people was the pride issue, too; because in high school I never needed to. And so I was like, I can do this by myself. That was a bad idea. But that’s been a really good thing though, about MIT. Making me work with other people, because you can’t do it by yourself, or you can’t do it by yourself in a reasonable amount of time. I think I spent twelve hours on my first p-set. Because I was working by myself, and then I got like half of it wrong, too, because I didn’t—because I messed stuff up that somebody else would have caught, like you differentiated that wrong. Or you know, something stupid because you worked on a p-set seven hours straight because you’re like, “Oh, my gosh... It’s due tomorrow.”

Spencer: Well, I was very lucky to have Struik in mathematics and Parry in electrical engineering. And those are the two best professors I had. And then I took some course—one course in my second year graduate work at Harvard on the reciprocal trade treaty between Harvard and MIT and I had a very good course in real variables and now—complex variables. And that was a course, a very good course—one of the three best I had.

McDonald: Yes, Harvard’s neat. I took a class at Harvard last semester.

Spencer: You did?

McDonald: At the Divinity School. It was cool.

Mascardo: You can at Wellesley too, right?

Spencer: And it’s nice that we have that possibility; going from one school to the other.

Mascardo: So you don’t regret going to MIT then?

McDonald: Not at all.

Mascardo: Okay, that’s good!

Widener: It was definitely the place for me, I think.

Mascardo: How come?

McDonald: She’s so smart. If she went anywhere else, she would be bored. She already bored at MIT. Sorry, I’ll let you continue. I had to interject that.

Mascardo: You want to do high school chemistry, no research or anything like that?

Widener: Yes, I don’t think so. I have a summer internship in research this summer and I’ll see more about research, and if I like it or not. But in high school, I didn’t really have many friends, I was pretty studious. And coming to MIT, I’ve really blossomed. Heather, my roommate knew me before I came, and has seen me change over the two years I’ve been there.

Mascardo: So it was the place for you. Was it the place for you immediately?

McDonald: Well, I wasn’t going to go to MIT when I came to the Campus Preview Weekend. I was like, “This school’s expensive, I have a scholarship to go to Case Western. Why would I come here?” And then I just fell in love with the people. I was like “Wow this is a place for me.” I never felt like I fit in high school. All my friends were older than me, and especially senior year all my friends were gone so it was just me.
Mascardo: One thing that impresses me about MIT is not so much the standard, I mean, that’s always part of it, but how it’s multi-disciplinary. It’s interwoven in so many ways. Like that’s what I like about Bonnie Berger --even though she came from Brandeis, and she did her thesis with Sylvio Macali in Computer Science-- she’s doing something totally different. She’s collaborating with so many other people on, I think it is computational biology, and things of that sort. And you know you can take her program without having any bio background ‘cause her course just tells you what you need to know. You don’t have to go back, like at Connecticut, what I hate is that if you want to know anything about thermodynamics having anything to do with semiconductors or anything like that in the EE Department, there’s no course for that. You have to go all the way back to physics and learn everything about thermodynamics, and then extract from that what you want, to solve your problem, you know? Whereas, at MIT, it is designed to be sort of interdisciplinary from the ground up.

McDonald: Yes, I think that’s the thing the MIT teaches you to do more than anything else. Is just how to solve problems, how to look at them from a bunch of different angles. ..Which is cool!

Mascardo: Yes, so you don’t have to waste your time getting this degree, this degree, and this degree. You can focus on the problem and choose from all these different areas, you know, that have what you need. You know? That’s what I like best about it, I think. I don’t know if it was like that in your day, Domina. Well, since you took all the courses anyway, maybe you were the ground breaker, you know, as far as making it interwoven in that way. You took all the classes that you could.

Spencer: Well, I loved MIT, and I loved the sailing.

McDonald: Yes, the sailing pavilion is awesome.

Mascardo: Remember that time we went sailing? You know how you have the cards? We hadn’t gone sailing in how long. Right, so I go, “What are the chances they’d have your card there?” I said, “Go down and find out, I’ll hang around here.” The guy on the desk looked in the card bin, there it was.

McDonald: They have everybody’s cards there.

Mascardo: It never got purged or anything. There it was, the same card that you always used, right?

McDonald: Yes, it’s pretty cool.

Spencer: But, on the whole, the University of Connecticut has been very good to me. I’m very lucky

Mascardo: There are some advantages. You are certainly making more money than you ever would have at MIT. You certainly didn’t have to retire, as you would have had to at MIT.

Spencer: Not anymore.

Mascardo: Well, yes. But, if you were there at that time, you would have had to retire.

Spencer: I might, I guess.

Mascardo: You would have had to. Now it might be different. Yeah, so, it’s worked itself out in a lot of ways, actually.

Spencer: So there are many, many good things about the University of Connecticut and the other good thing is to feel that at the University of Connecticut, the majority of my students are the first in their family to get an education.
McDonald: That’s cool.
Mascardo: You should ask Patricia whether she believes in transmutations of materials.
Spencer: And the very...
Mascardo: She’s read some research on that.
Spencer: The first generation that gets to go to college to get a good education. And that’s what we have in many cases.
McDonald: That’s really cool.
Spencer: This morning I had two students come in.
Mascardo: For the final?
Spencer: And take up my whole morning. I almost was late to my final exam today.
Mascardo: What did they want?
Spencer: They are students I had years ago.
Mascardo: Like how many years ago?
Spencer: I do not know. I am thinking of going to my roll books and finding what year they were in.
Mascardo: Do you remember their names?
Spencer: The one had just retired recently and he brought me a beautiful present he had made out of black walnut. It’s a trivet.
Mascardo: Oh, a trivet. Cool.
Spencer: About this big. And it’s exquisitely made, all out of one piece of black walnut.
Mascardo: And he just happened to be at the University?
Spencer: It had a pattern going this way on the top and this way on the bottom. It’s in my briefcase out in the car.
Mascardo: So, he was your student probably in the sixties if he is retired now.
Spencer: I don’t know when he was my student. I haven’t figured that out, but he’s retired now. And he had a book that I had written, the book on vectors. And he wanted me to autograph it and he called up the department and found out when I had a final exam this week. And then he had someone who was a friend of his with him who also had a book. He had found a copy of our first book on lighting design.
Mascardo: That’s the forties.
Spencer: Back in the forties, forty-eight that was published. That’s quite a while ago. And he found it in a secondhand book store where it looked to be in perfect condition, and he wanted me to autograph it. And they both want to hear from me again. I am thinking of going to my old roll books, and trying to see when I can talk to them.
Mascardo: What is that joke you say? When you’re on the subway and you step on someone’s foot chances are that’s one of your former students.
Spencer: I joke that if I step on anyone’s toes in the subway, they are a student that I had at sometime.
Mascardo: Like Mildred Jefferson, the first black woman to graduate Harvard Medical School. She was your student at Tufts. And suddenly we’re there, and she’s giving a lecture on anti-abortion, or something, somewhere—she’s retired now. She’s got to be in her seventies or eighties.
Spencer: Well, I had her when I taught at Tufts, so that’s a long time ago.
Mascardo: Right, right.
McDonald: That’s awesome.
Spencer: But she was, I think, the first black student I ever had.
McDonald: Cool.
Spencer: And we don’t have many. I had one black student in my class this term and I’m hoping I can give him a decent grade. He was the last student to turn in his final. I don’t know whether that means he did better on it, or the worst of the whole class.
McDonald: It means he checked his work.
Spencer: At least he came today, and was at the final.
McDonald: Were there students who didn’t show up for the final exam?
Spencer: No, I think they all came for it.
Widener: I think there’s sort of a grade distribution like this in terms of time you turn in your final. There are the people who turn it in really early who knew everything. And then you have most people who check it like fifty thousand times, fix every single problem and use up every single minute.
Spencer: What happened today in this class, there were fifteen in it, and all the girls were sitting near the window and the boys came in a little bit late and were sitting near the door. And I looked at them about halfway through the exam and I suddenly realized all the girls were gone. And my black student was the last to leave. I hope that doesn’t mean he was the worst.
McDonald: We’ll go with checking his exam.
Spencer: Maybe he was checking everything. But I would feel much better if I had more black students. They need to get an education—now we have Patrick.
McDonald: I mean he’s black, but he’s an international student, so it’s different from an African-American.
Spencer: And his uncle was one of the best students I ever had. I had just one class—twenty-five years ago or something like that was all black except for one or two white people
McDonald: Really?
Spencer: And Patrick’s uncle, Eric, was the best student in that class, and then he turned up a few years later and he was a professor in electrical engineering. And now I am working on a problem with his nephew.
Mascardo: Eric told me this story once when you were commuting. You told this in class, he said that, “She told us that she pulled off the side of the road when your car hit one hundred thousand miles and celebrated.” And so I was like, “Really?” So he goes, “Yeah, she begins the class by going, ‘Well, I pulled over today on the highway to celebrate something. Does anyone know what I celebrated?’ Of course nobody did. ‘Well, my automobile went to one hundred thousand miles and every hundred thousand miles, I celebrate.’” So she stops. Imagine if the cops said, “Excuse me. What are you doing there? Ma’am, have you been drinking? What are you celebrating?” “My odometer here.” (Laughter) Or remember that time you blessed the car?
Spencer: I always bless the car.
Mascardo: She always blesses the car when she’s driving, and that was when Mikhail Gorbachev was the Russian president and Ronald Regan the U.S. president. I remember we were driving to Connecticut and you don’t get done with that prayer until you’re, I think, on the Mass Pike. Right? You know, it takes you, you go behind the Gardner area, over the Fenway, down Storrow Drive and then when we
get to the toll, basically, that’s when you’re done. And I just said to myself, “I forgot what I was going to say now.” Cause she would be saying this big long prayer.

Spencer: Well, I have always thought that it was a good idea to start the drive to Connecticut by blessing the car. And still feel it.

McDonald: Yes.

Spencer: But, it’s been a lot of fun and I am very thankful I got to teach at Connecticut and still get to teach at Connecticut.

Mascardo: And Patricia will be teaching when she gets out. You know, that’s what she wants to do.

Spencer: I got the official papers for next semester.

Mascardo: I know you told me.

Spencer: But I didn’t get them signed today because those people were there all the time and I wanted to check them very carefully. But I’ll check that and get my papers graded this weekend, or Sunday. We’re going to a concert Sunday night of microtonal music.

Mascardo: Oh gosh.

Spencer: Do you know what microtonal music is?

Mascardo: It’s making up our own scale, I guess

Spencer: Do you know what microtonal music it?

McDonald: I have no idea what microtonal music is.

Spencer: Do you know how the scale that we ordinarily use is made up? It’s an octave.

McDonald: It’s umm... oh gosh we just learned this in other day.

Spencer: It’s double.

McDonald: Yes, it’s...

Spencer: And if a fifth is another small integer, isn’t it? And so on. In the ordinary scale it is small integers. The microtonal people have developed in the twentieth century and they use larger integers.

McDonald: Interesting.

Spencer: Putting in things like thirteen or seventeen and so on.

Mascardo: I know, it’s crazy.

Spencer: You know how it’s sounds?

Mascardo: It sounds like someone is dying or something. It does.

Spencer: It sounds so mournful. Once I was told about someone who heard microtonal music and went insane. I can understand that one can almost go insane because it sounds so awful.

Widener: And you want to go to the concert?

Spencer: Yes, I’m going to the concert.

Mascardo: It’s a friend of hers who teaches at the conservatory.

Spencer: I know the professor who is getting an honorary degree at the New England Conservatory a week from Sunday. And they’re having a special concert this Sunday evening. And my son used to play in a trio when they were children with his son. It was not microtonal. It was pleasant.

Mascardo: It is very, very somber.

Spencer: But, his son is now a musician trying to make his way in New York City, which is difficult if you are a musician
And he’s going to come up and play at the concert in Saint Paul’s Church in Boston on Sunday evening at eight o’clock.

That’s Matthew, right?

And Euclid says he will go with me to the...

Matthew Maneri is coming to play in it. Matthew was his son. They played in a trio together at the New England Conservatory when they were children. Euclid at least is making more of a living than...

Yes, I think Matthew builds some of his own instruments, too.

Yes, Matthew has done all kinds of original things with music. Built strange instruments that are new and they try out strange harmonies and these harmonies might sound so terrible that you feel as though you might go insane if you had to listen to them for too long.

But they’re experimental, right?

They are trying to do something...

Progressive

Something new in music and they’re charming people, wonderful people. The mother is an artist and the children end up musicians. And Joe Maneri is now eighty-one, I think, and he’s very much overweight. And he is barely able to walk around at the present time. Sometimes uses a wheelchair. So I’d better go to his concert and try to find the good in it and then go to see him get an honorary degree at the New England Conservatory which is one of the two or three finest conservatories in the entire country.

Yes, it’s impressive. You can always bring ear plugs. (Laughter)

No, I won’t bring earplugs.

I’m just kidding.

I will not and Nikki will probably go to the concert too and she had better behave herself. She always behaves at concerts perfectly. She’s used to them.

Is there any chance she’ll join in?

Nikki?

Is there any chance Nikki will join in and start howling or something?

She’s pretty good, Nikki.

She’s a wonderful little girl.

She’s cute.

I know.

But, I’m very thankful for the University of Connecticut. They did treat women decently much sooner than most other schools. And of course the man who was head of the Mathematics Department that hired me at the University of Connecticut was one of the, I think he was the second PhD in mathematics at the university, at MIT.

Really?

Schafer, or Cheney?

Cheney.

Cheney. I didn’t know that Cheney was at MIT.

Cheney got his degree in mathematics and he was the one they sent down to New York City to meet Professor Struik when he came here for holiday.
Really?
He was assigned to first go to meet him at the boat when he came to New York to come and be a professor here.
Interesting.
Professor Struik, he got his Doctor’s degree at Gottingen. He got his Doctor’s degree in Holland and then he got a two year Rockefeller Fellowship to post graduate after his Doctor’s and went to Rome one year and then to Gottingen. That sounds as though, you think he would get a good job after that. Wouldn’t you?
You’d think.
The only thing he could get in Holland was a job teaching in the high school.
Strange.
And he had married this beautiful girl who was Czechoslovakian and the first woman to get a Doctor’s degree. He met her at mathematics meetings in Germany. And she was very attractive, I recall, proud of her life and suddenly she was in the insane asylum.
What?
They were in Rome then, well, she wasn’t in the insane asylum in the beginning. He had gone there to study with Levi Civita in Rome for the first year of his fellowship, just after they’d been married. And he’s been married to her maybe six months, when he got a phone call from Levi Civita saying, “Your wife is here. Will you please come and get her.” And you know what she had done? She had gone to the professor who her husband had come to study with and told him that she would throw herself on the railroad tracks if he would not take her to bed immediately.
Awkward.
I think she was like bipolar or something like that.
But she was in love with him. And what did he do? He immediately called Professor Struik up and said, “Come get your wife.” And made arrangements for them to stay at a religious, probably Catholic, because most of Italy is Catholic, at a place where they took in guests and paid some attention to them so they would take care of her up in the mountains above Rome. She got better and they went and had a wonderful honeymoon again in Sicily by spring. And then he came up to be, for the second year of his fellowship, at Gottingen. At that time, Hilbert was head of the Mathematics Department in Gottingen, and he had come to study under Felix Klein who was one of the people I had especially admired in mathematics. And Struik got there and found no one around in the Mathematics Department at this school he’d come to study. Do you know where they were?
No.
They were all at Felix Klein’s funeral. He had just died and the man he had come to study with was gone.
Oh no.
Not funny, but...
What did he do?
Spencer: And what did they do? They put him in charge of preparing his unfinished manuscripts for publication. And so that went pretty well and that year—have you heard of Norbert Weiner?

McDonald: Yes.

Spencer: He was one of the most famous mathematicians at MIT. He had just gotten married and was in Gottingen that year. He wasn’t famous yet. Nobody paid any attention to him, maybe because he was Jewish, I don’t know. But in any case, Struik got to know him. And Struik took pity on him and took long walks with him and treated his wife nicely, and got to be good friends with him. His wife was so upset that he didn’t have a job at the end of this wonderful Rockefeller Fellowship for two years, except teaching at the high school, that she went insane again and she had to be locked up in the insane asylum in Holland. Weiner came back to MIT but they communicated. Norbert Weiner talked to the Mathematics Department here and talked them into inviting Struik to come over not for a permanent position, but for one semester to teach one course. Struik came over, leaving his wife in the insane asylum in Holland. And Professor Cheney was the man that hired me from the University of Connecticut, went to meet him at the boat in New York, brought him back, went to all his classes to help him with his English. He thought Struik was so wonderful. MIT thought he was so wonderful they decided to hire him full time. He sent for his wife. She was out of the hospital, all-cured, when he had another job.

Mascardo: Hey, excuse me Domina, but I think they are going to have to get their train soon.

Spencer: And she came over and had three daughters, but she never got any chance to use her mathematics in this country or anywhere else.

Mascardo: Do you want to lie down and take a nap while I take them to the train and wait for Patrick here?

Spencer: It’s time for you to leave?

Mascardo: Yes, get all your stuff together.

McDonald: Just let me turn this off.
HORSE SHOW ALMOST IN THE SHADOW OF CITY HALL

Students of the Friends' Select School, 17th st. and the Parkway, recently staged their annual horse show on the grounds of the school. The picture shows Miss M. E. Armstrong, Calvin L. Kaiser, Miss D. Spencer and Miss M. L. Snyder, left to right, on their mounts.

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LY FIT

physics. Now, on its own, it's recognized as the basic science, the one at the bottom of all scientific work—pure as well as applied. Literally a physicist knows what makes the wheels go round. She knows the properties of various materials as well as she knows her lieutenant's hash marks. To her, electromagnetics, electric waves, acoustics, mechanics and optics are not alarming symptoms but possible fields of assignment where she can work to develop new tools to speed the coming of victory. The results of her research are the ideas which engineers shape to the requirements of mass production. They are then passed along to industry, which applies them to the manufacture of war matériel.

Admittedly it's a tough strain on our imagination to see in a first-year physics course—with its weights and pulleys and tired old batteries marked "plus" and "minus"—an introduction to a subject which, with a little pushing on our part, can lead to a lifetime career of hobnobbing with the elements of the universe. But even more importantly it can mean a war job that may easily be the life line of our fighting men.

We all know this is a scientific war but few of us realize that physics can turn the tide of it. It's quite possible that out of (Continued on page 212)
TECH TO GRADUATE GIRLS, 18

At the age of 18, when most students are finishing high school, two Greater Boston girls will graduate from Massachusetts Institute of Technology next month in high standing.

Youngest co-eds ever in the senior class at Tech are Domina Spencer of Cambridge and Ruth Berman of Roxbury. Majoring in chemistry, Miss Berman has finished her work in three years. Miss Spencer seeks a degree in physics.

In spite of their strenuous studies, both girls have found time, not only for social activities on the campus, but have won school fame for dinghy sailing on the Charles River.

GIRLS OF 18 YEARS TO GRADUATE AT TECH

Miss Spencer, Miss Berman

Active Outside Course

Two Technology girls, believed to be the youngest co-eds ever to enter Tech, are expected to receive their degrees at commencement, one week from Tuesday.

The girls are Domina Spencer of Cambridge and Ruth Berman of Roxbury. Miss Berman will achieve the unusual distinction of winning her degree in three years.

Both girls have been active in extra-curricular activities. Miss Berman has served as the feature editor of the Tech, college paper, and both girls have been active in dinghy sailing on the Charles and recently helped the Tech co-eds to triumph over many other girls' schools and colleges in a regatta held on the Charles.

The girls were 18 years old last October. Miss Spencer is studying for the degree in physics, while Miss Berman majored in chemistry.
HERE'S A PH. D.—AT 22

By Anne Hagen

The tall, slim young lady standing before physics and mathematics classes at American University might easily be mistaken for one of the sophomores—but don't be misled. Twenty-two years old Dr. Domina Spencer recently received her degree as a doctor of philosophy at Massachusetts Institute of Technology, and is the youngest instructor ever to grace the A. U. campus.

Dr. Spencer, a native of Pittsburgh, Pa., took the course leading to a bachelor degree in physics at M. I. T. in two years, finishing at 18. She received her master's by majoring in mathematics a year later, and at 21 became a mony. In St. Louis, Mo., before the wartime Lighting Conference of the Illuminating Engineering Society, she spoke on methods of calculation of illumination—particularly important in defense plants.

She has also spoken before the American Mathematical Society at Vassar, and next month will present a paper at the New York meeting of the Optical Society on the introduction of metric into color space, which means scientific methods of matching color—just to give you a rough idea.

No hard-bitten student, Dr. Spencer's main outdoor interest is in sail boating, in which she was very active at M. I. T. So, enthusiastic is
WINNERS! Dominia Spencer and Thomas Gouzeule, winners of the "Captain Fury" regatta on Charles River, opposite MIT pavilion. They hold the trophy presented by Brian Aherne, star of the film, "Captain Fury," current at Loew's State-Orpheum Theaters.